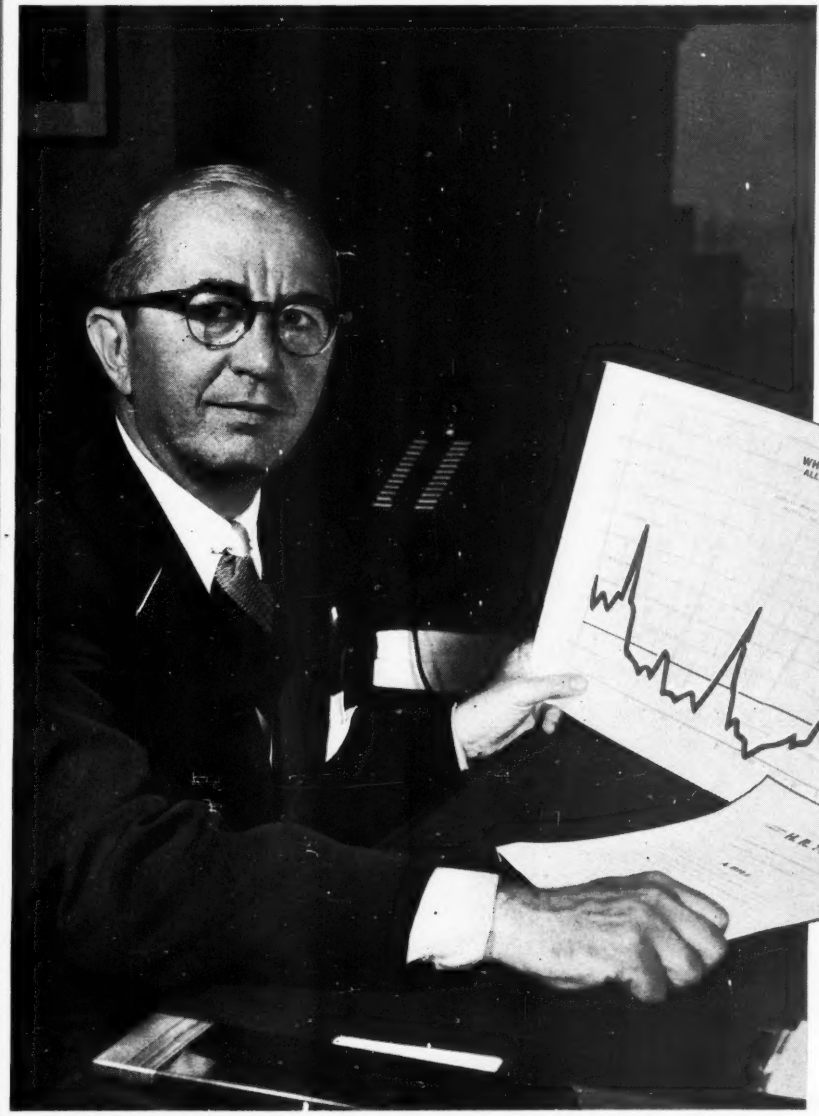
MAY 5, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

MAY 5 - 1952



✓ **THE STEEL DEBACLE, p. 69**
Where Can We Go from Here?

✓ **MAGNESIUM FABRICATION, p. 98**
Better Techniques Lower Cost

✓ **FURNACE BRAZING, p. 102**
Atmospheres Control Results

NEW LIFE FOR LIFO

Accountant H. T. McAnly tells why you should support a bill for last-in-first-out method of inventory pricing—p. 80

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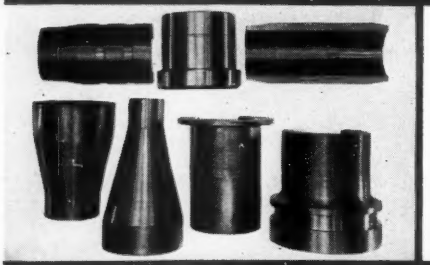
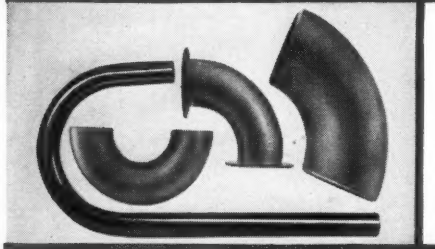
CONTENTS — PAGE 5

SPUN



UPSET

SWAGED and EXPANDED



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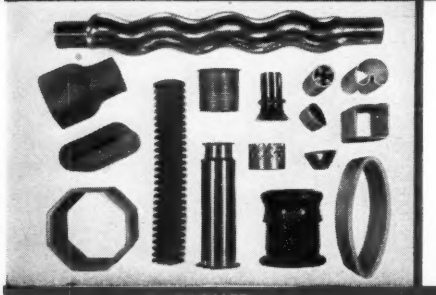

FORMED

let's
take a
CLOSER LOOK
at

Fabrication Requirements

If you make hollow parts the economical way—from tubing—chances are you have one or more fabricating problems. This typical array of parts illustrates the wide range in severity of working that is involved in such operations as spinning, swaging, expanding, upsetting, bending, and forming. A corresponding diversity exists in the type, grade, finish, and mill condition of seamless and welded steel tubing used for their manufacture.

Remember, tubing is more than bar stock with a hole in it. It is a semi-finished product. B&W's ability to match its tubing to a myriad of end uses may enable you to make a better product . . . easier. Ask Mr. Tubes—your B&W Representative—for help in selecting the tubing that is best for *your* fabricating requirements. Request a copy of Bulletin TB-324.

TA-1641-M

B&W SEAMLESS and WELDED TUBES

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION

General Offices & Plants
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
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Sales Offices: Beaver Falls, Pa. • Boston 16, Mass. • Chicago 3, Ill. • Cleveland 14, Ohio
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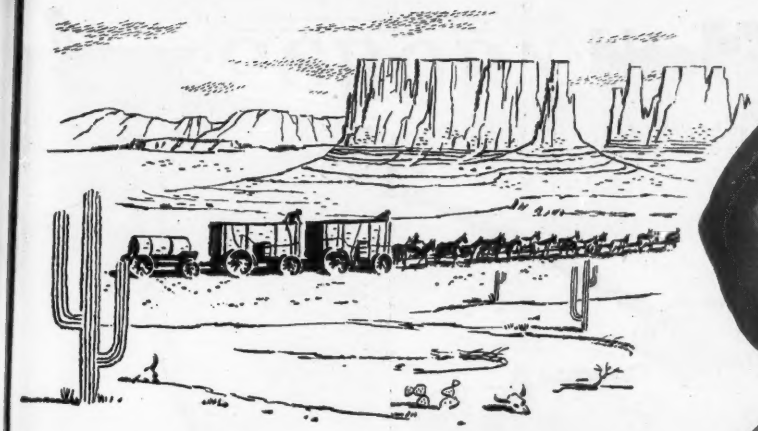
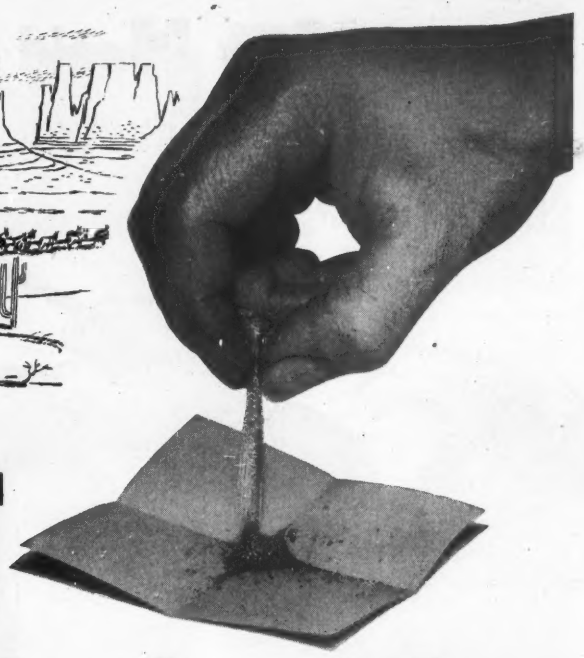




BORON

increases hardenability of alloy steels

When boron is used in an alloy steel it increases the depth to which the steel will harden when quenched. This result is limited to sections in sizes that can be liquid-quenched effectively.

Only a few thousandths of 1 pct of boron is all that it takes to intensify the effects of the other hardening alloys in steel. Boron does not completely replace these other elements but it does reduce the quantity needed to produce a given depth hardness.

This means that boron, of which the nation has an ample supply, can conserve such alloying elements as nickel and molybdenum that are in the critical-shortage category. It also means that boron-treated steels are effective alternates for many of the constructional alloy steels that would normally be used by civilian as well as the nation's defense supporting industries.

Boron steels usually require closer temperature control for heat-treatment than is required with ordinary high-alloy steels, but aside from this they present no special problems. Their cold- and hot-working properties are equal or better than those of ordinary alloy steels. They also have improved machinability because of their lower alloy content.

Bethlehem manufactures boron steels in addition to regular alloy grades, special and carbon steels. If you need information on analysis or heat-treatment of steel for any purpose, our metallurgists will be glad to help. Write or phone giving complete details of your problem.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM ALLOY STEELS

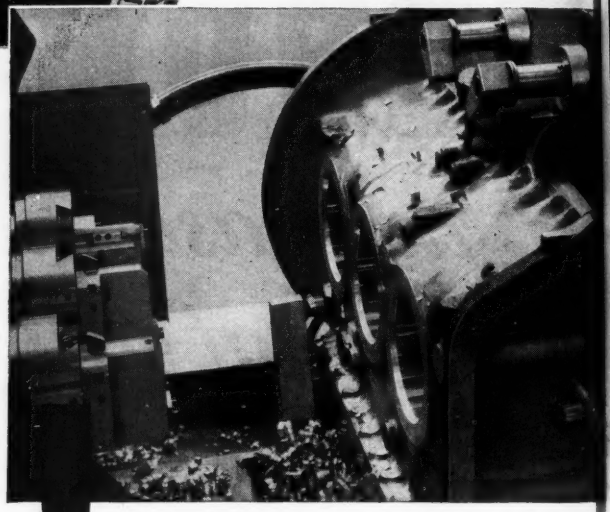
BETHLEHEM STEEL

Here's How Heald helps defense production shift into high

Heald Bore-Matics speed conversion from peace work to vital military production

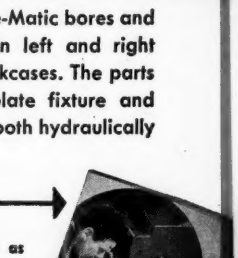
Tractors or tanks — automobiles or military planes — they're all the same to a Heald Bore-Matic. The versatility of these high-precision, high-production machines has done much to smooth the way for rapid conversion to defense work.

An equally important factor is the vast storehouse of precision finishing data maintained in Heald's engineering files — plus the specialized experience of Heald engineers in *every field* of borizing, internal and rotary surface grinding work. Remember — when it comes to precision finishing, it pays to come to Heald.



This Heald Model 421 Bore-Matic bores and chamfers cylinder holes in left and right halves of tank engine crankcases. The parts are held on an angle plate fixture and clamping is accomplished both hydraulically and manually.

THE STORY OF HEALD MACHINES as applied to defense production is a mighty important one to any company engaged in this type of work. This new 28-page booklet contains much valuable information on equipment, work fixtures, borizing and grinding methods. Send for your free copy of "Defense, our job today."



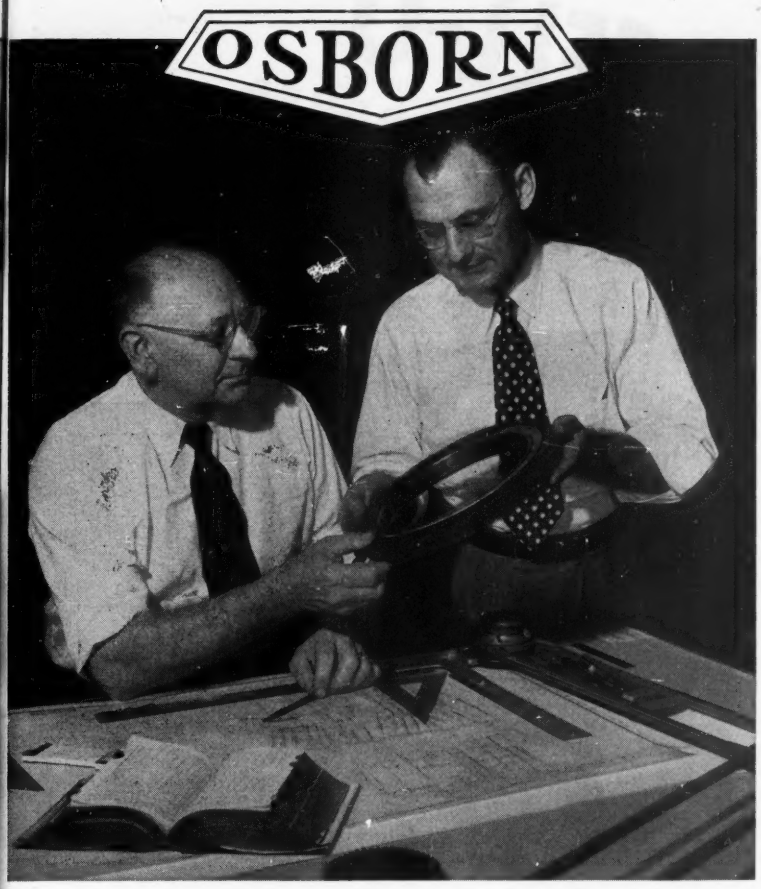
HEALD

Heald machines speed the nation's production

THE HEALD MACHINE COMPANY

WORCESTER 6, MASSACHUSETTS

Branch Offices: Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York



Board of strategy for your "Operation Push Button"

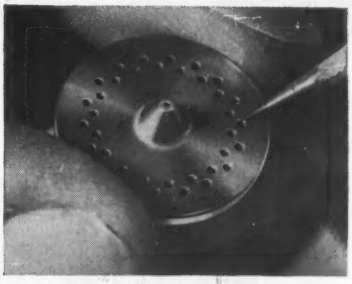
Your need for mechanization today finds a powerful ally in the machine design talents of Osborn.

When your **O**sborn **B**rushing **A**nalyst recommends the latest in "push button" brushing methods to solve your cleaning and finishing problems he is backed by experienced engineers and craftsmen—research men, designers and production men who serve you these ways: (1) They develop basic brushing methods to solve your problem. (2) They help your engineers or your machine builder to design the right brushing machine for you. (3) If desirable, they even design the brushing machine for you and supervise its construction. The proper approach depends on *your* needs. The main thing is:

You *know* your brushing problems are in good hands when you call in your **OBA.** This thorough service is yours for the asking. Call today or write *The Osborn Manufacturing Company, Dept. 707, 5401 Hamilton Ave., Cleveland 14, Ohio.*

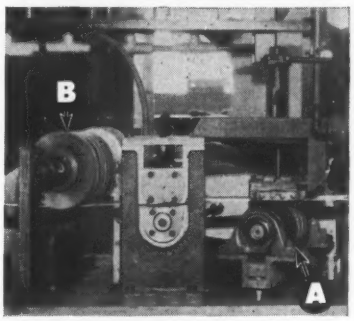
Osborn Brushes

OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES



TINY BUT TOUGH. Drilling of this nickel-size stainless steel part of an aircraft engine left burrs around the edges which were difficult to remove. The **O**sborn **B**rushing **A**nalyst helped solve the problem by using Osborn brass wire brushes and an abrasive compound with the right amount of grit. Now burrs come off clean and sharp corners of holes are well rounded . . . *at the push of a button.*

TRY MASTER® STRIP. This Osborn Brush is available in forms, shapes, sizes and fill material to match your job of cleaning, scrubbing or finishing . . . to boost your output and cut your costs . . . *at the push of a button.*



IT'S AUTOMATIC. This machine, developed with the help of the **O**sborn **B**rushing **A**nalyst, cleans steel-backed, babbitt-lined strip for production of automotive sleeve bearings. With the strip traveling continuously, Osborn Master® Wheel Brushes (A) remove all dirt, rust and metal particles from the steel surface. Osborn Monarch® Sections (B) then thoroughly clean the babbitt side. Perhaps a similar brushing method can help improve *your* production . . . *at the push of a button.*

EX-CELL-O

PRODUCTION-PROVED MACHINE MILLS JET BLADES

Above: Jet blades of this type can be milled quickly, accurately, efficiently on the Ex-Cell-O Profile Miller.

Right: Ex-Cell-O Precision Profile Miller, Style 86.

XLO
EX-CELL-O for PRECISION

EX-CELL-O'S COMPLETE LINE OF STANDARD MACHINES FOR FINISHING JET BLADES:

STYLE 85, FOR GRINDING THE ROOT FORM

STYLE 86, FOR MILLING THE AIRFOIL

STYLE 87, FOR GRINDING THE AIRFOIL

STYLE 88, FOR POLISHING THE AIRFOIL

MILLS COMPLETE AIRFOIL, *INCLUDING LEADING AND TRAILING EDGES*—AUTOMATICALLY

Here is a production-proved machine for automatically milling the complete airfoil form (including leading and trailing edges) of jet engine compressor blades. An outstanding feature is the use of back rests that support the blade rigidly throughout each cutting stroke to prevent deflection of the blade by pressure of the milling cutter.

The Ex-Cell-O Precision Profile Miller, Style 86, is hydraulically operated and fully automatic except for loading, unloading and pressing the start button. The airfoil form is generated by a master cam made from the engineers' glass layouts. The work travels lengthwise across the milling cutter and is indexed after each cutting stroke, the indexing and cutting being repeated until the part has rotated 360 degrees.

For further information and detailed specifications on blade finishing machines write, wire or phone to Ex-Cell-O in Detroit.

EX-CELL-O CORPORATION DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS
DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

1-38

This Week in Metalworking

STEEL

Vol. 130 No. 18 May 5, 1952

√NEWS √PRODUCTION-ENGINEERING √MARKETS

√Metalworking Outlook 61

As the Editor Views the News 65
Editor-in-Chief Earl L. Shaner's views and reviews of the political and industrial scenes in this, an election year

Windows of Washington 76

Mirrors of Motordom 83

The Business Trend 87
Facts and Figures on segments of metalworking . . . STEEL's Industrial Production Index . . . Barometers of Business

Men of Industry 91

√Production-Engineering News at a Glance 97

Magnesium Fabrication: Lower Finished Costs 98
Raw cost is high, yet finished cost may be lower than for other metals, depending on equipment, techniques

Furnace Brazing: Atmospheres Set the Pace 102
Developments in atmospheres make it possible to braze practically all metals in controlled furnaces

Electrostatic Filtration: Dust Comes Out of the Air 105
Dust particles get charge in ionizer, get drawn to oppositely charged plates in collecting cell

Planned Maintenance 106
Seven-point program of Pittsburgh steelmaker reduces delays at the mill and results in pared production costs

New Products and Equipment 161

√The Market Outlook 179
Metal Prices and Composites start on Page 180

The Metal Market 191

Behind the Scenes	6	Obituaries	94
Letters to the Editors	12	Calendar of Meetings	157
Subcontract Summary	74	Helpful Literature	175
Checklist on Controls	75	Here and There in Industry	198

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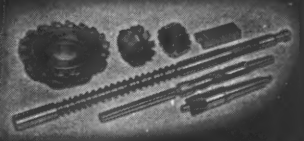
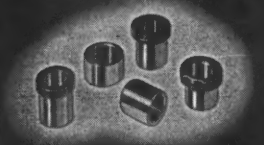
XLO
EX-CELL-O for PRECISION

PRECISION MACHINE TOOLS

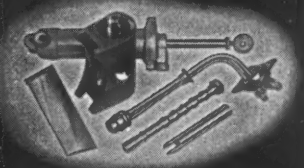


CONTINENTAL CUTTING TOOLS

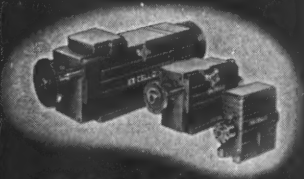
PRECISION GRINDING SPINDLES



DRILL JIG BUSHINGS



AIRCRAFT AND PRECISION PARTS



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51-18

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If not, however, our laboratory men will work with your problem—formulating, blending, testing until they finally develop the right oil for the job.

You may ask who's going to pay for this work. The answer is that Pelron will, until we develop a solution to your problem. Then you only pay for each drum of oil made to the formula developed to do your work better.

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INDUSTRIAL OILS AND CHEMICALS FOR BETTER PRODUCTION AT LOWER COST

7740 W. 47th Street • Lyons, Illinois

Behind the Scenes...

Cover Story

The cover this week was worked up with the greatest speed of any the editors and artists have thus far produced. The story on LIFO—the last-in, first-out method of inventory pricing—to which the cover refers was in the works nearly three weeks ago and scheduled for the May 12 issue.

However, the longer the editors worked on the yarn, the greater its importance seemed to them and the greater the need appeared to inform the readers to win their support for a congressional bill that will markedly increase the usefulness of LIFO.

So, a switch was made at the last minute. A story on gages originally scheduled as a cover story for May 5 was postponed until May 12. The tempo of cover plans for LIFO, which had been going ahead at a rather leisurely pace, were suddenly stepped up.

It was decided that an appropriate cover for LIFO would be a photo of H. T. McAnly, a partner in the accounting firm of Ernst & Ernst and a man who has been one of the sponsors of LIFO for a decade. The editors had already been interviewing him to get his interpretation and analysis of what LIFO can do for you.

Last Monday afternoon, Apr. 28, a United Press photographer took a shot of Mr. McAnly at his desk. One hour after the photo was taken, a print was ready for STEEL's artists. The layout was made and the art was ready to go to the engravers by Monday evening. A copper engraving plate was delivered to our printing department by Tuesday evening. The printing of the cover was ready to start last Wednesday morning, on the usual schedule.

On this Monday morning, May 5, the cover, the story, the magazine are all ready at your service.

Overstocked

The federal government owns 848,567 typewriters, better than three and a half machines for every stenographer on the payroll. It has in storage some 195 million dozen "surplus" eggs and has supply of paper clips to last until the year 2030 A.D. For one officers' club the government bought 15 sets of fishing tackle at $520 each.

European Visitor

In town last week was Vincent Delport, STEEL's European editor with headquarters in London. He supervises the job done by correspondents in England, France, Belgium, Germany, Italy and Sweden.

He joined STEEL as French correspondent in 1922. Two years later he was transferred to London to head the European bureau. He's now in the U. S. to attend the International Foundry Congress & Show in Atlantic City, May 1-7.

We're Ready

We've just cleaned and oiled our rod and reel, and filled in a little card the company sends around asking our preference on vacations. We signed up for a July date and have written for reservations at a fishing camp in Ontario, Canada. We're ready to leave tomorrow.

Puzzle Corner

We've had a lot of answers in to the moon-latitude problem of Apr. 21, but thus far none of them has been precisely correct. The exact answer is 2 18′ 51.4″. The answer that comes the closest to that is one submitted by George W. Frederick of Republic Steel Corp. He says the latitude is 2 18′ 49.0″.

Here's one submitted by Henry B. Allen of Electric Controller & Mfg. Co., Cleveland:

A horse and an automobile start from the same point to go to a point 14 miles away. The horse travels at a rate of 7 miles per hour and the auto at 20 miles per hour. How many miles will the auto cover if it keeps going back and forth from the horse to the destination, back to the horse, etc., until the horse reaches the destination?

Shrdlu

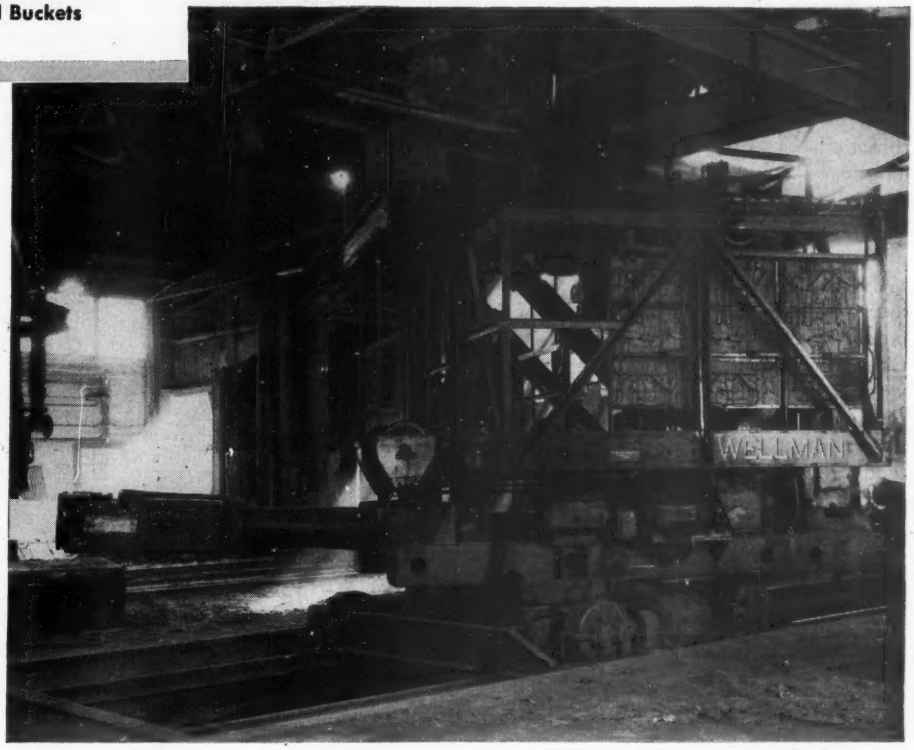
(Metalworking Outlook — Page 61)

Wellman will build it

- Special Cranes
- Forging Manipulators
- Charging Machines
- Ore Unloaders
- Car Dumpers
- Gas Flue Systems
- Gas Reversing Valves
- Coke Pushers
- Mine Hoists
- Skip Hoists
- Ore and Coal Bridges
- Clamshell Buckets

Wellman forging manipulators

handle big ingots speedily, efficiently



Wellman Forging Manipulator with white-hot ingot ready for forging.

● Wellman Forging Manipulators hold hot steel ingots on anvil dies, turn them and keep them level for efficient forging . . . despite hammering shocks. You can count on *all* Wellman equipment for speedy, economical service. It is backed by more than a half century of leadership in designing manufacturing and construction of heavy materials handling facilities.

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PRECISION *plus*

. . . threads cut to Class 7 tolerances

Continuous threads cut on studs must meet exacting requirements to withstand the high pressures and temperatures to which pressure vessels, steel pipe flanges, fittings, and valves are subjected.

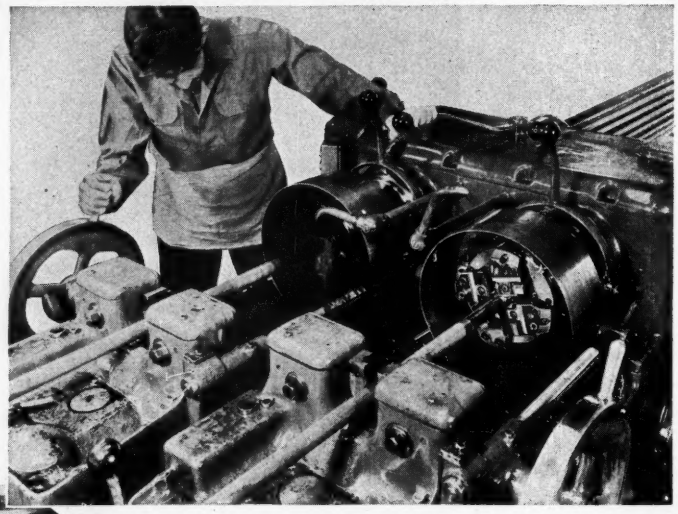
At the R.E.C. Corporation, New Rochelle, N. Y., continuous 1⅜" 8P threads are cut to within pitch diameter limits of .002 on 12-foot heat-treated bar stock of 269 to 311 Brinell hardness. The fully threaded bars are then cut into the desired stud lengths.

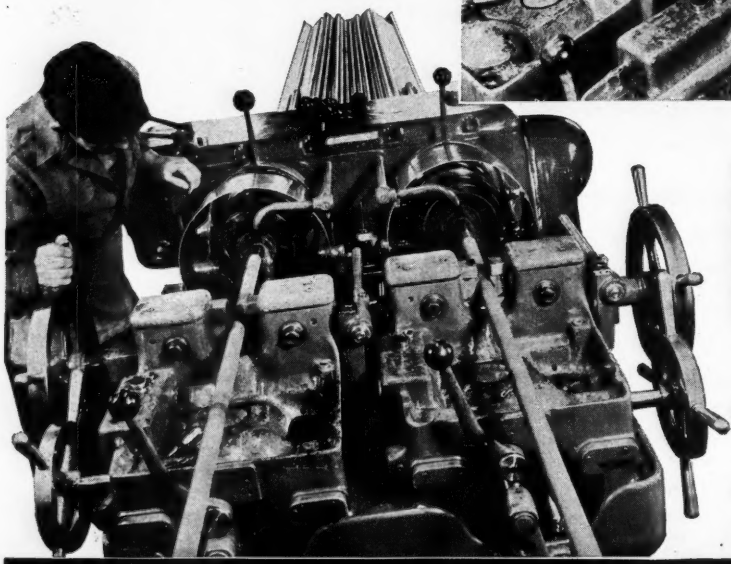
By using Double Head LANDMACO Leadscrew Threading Machines equipped with Hardened and Ground 2" LANCO VV Heads, threads ranging in diameter from ½" to 2" are cut in one pass with consistently fine finish to Class 7 tolerances. The leadscrew provides a positive, mechanical means of feeding the work into the die heads, thus assuring the maintenance of close lead tolerances.

Even on this precision threading operation, net production is good, averaging 36 linear feet per hour at a cutting speed of 25 surface feet per minute. An average of 108 linear feet of threads is cut between chaser regrindings, resulting in low tool cost and minimum down time.

Having given many similar outstanding performances in other fields, LANDMACO Machines can help to cut costs, step up output, and improve finish and accuracy in your thread production.

For complete information, write for Bulletin H-75.





LANDIS MACHINE COMPANY

WAYNESBORO, PENNSYLVANIA

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SOLVED BY NELWELD

TRANSFORMER MAKER FINDS

Continuous SAVINGS IN STUD APPLICATION

Split-second welding of studs to distribution transformer housing. Note ease with which operator uses portable Nelweld gun to weld to plate.

Continuous production savings — in fabricating time, in materials used and in release of production equipment—describes the Nelweld advantages gained by a manufacturer of power transformers.

Nelweld methods and the light-weight, portable Nelweld gun enable workmen to install studs in any position on the work at a rate of 4 or 5 per minute.

These same methods save time and materials by eliminating drilling and tapping procedures for threaded studs, and reinforcing of light gage casings to obtain tapping depth.

This results in reduced materials handling, lighter, stronger, and more weatherproof casings, plus the release of production manpower and equipment to other work.

Manufacturers everywhere are replacing time-consuming procedures (and the resulting tie-up of drilling and tapping equipment) with modern, fast-production Nelweld methods. The same advantages can improve your production efficiency.

For complete information on the advantages of Nelweld as applied to your fabricating problems, contact the nearest Nelson office or write Dept. S-2, Lorain, Ohio.

Fasten it Better... at Less Cost, with NELWELD

T M REG

NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

STEEL

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All LEWIS ROLLS bear this mark* of perfection

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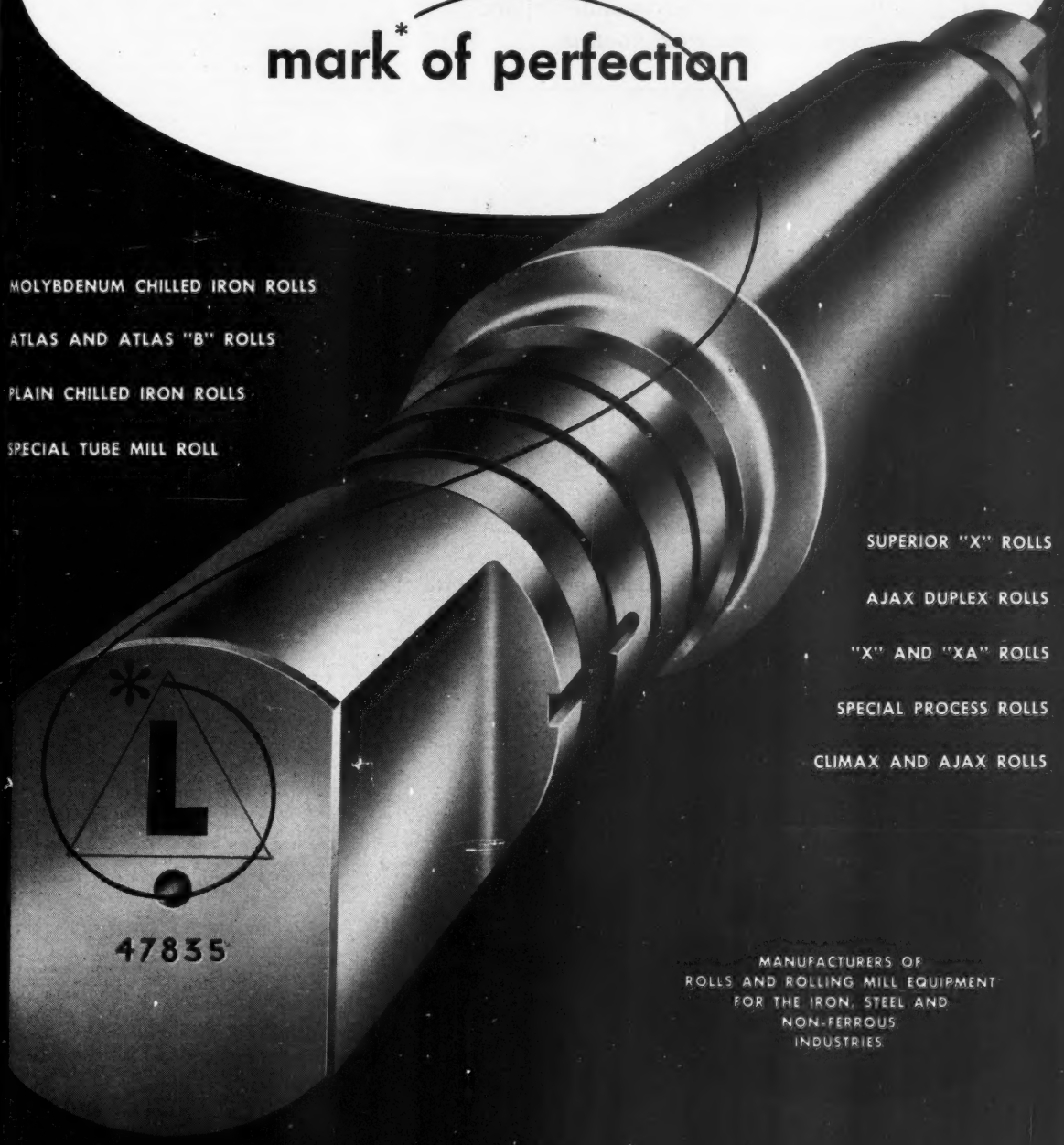

MANUFACTURERS OF
ROLLS AND ROLLING MILL EQUIPMENT
FOR THE IRON, STEEL AND
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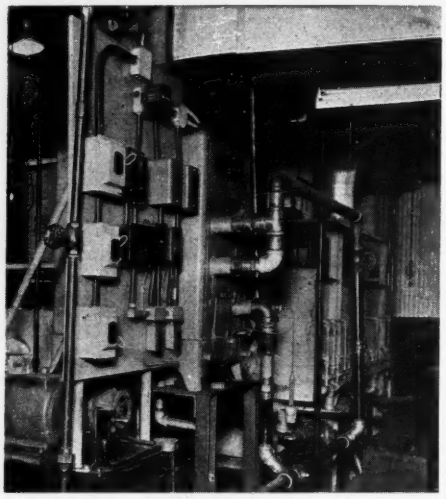
Improve Quenching and You Get Better Heat Treating

Your Department can have a better arrangement with Niagara Equipment that saves much space and increases your production.

This quench bath cooler gives you control of temperature and pays for itself quickly with water savings



● The NIAGARA AERO HEAT EXCHANGER transfers the heat from the quench bath to atmospheric air by evaporative cooling. It never fails to remove the heat at the rate of input, giving you real control of the quench bath temperature. This prevents flashing of oil quenches. In all cases it improves physical properties, saves loss of your product from rejections and gives you faster production, increasing your heat treating capacity. You can put heat back into the quench bath to save the losses of a "warm-up" period.

Savings in piping, pumping and power as well as great savings in cooling water return the cost of the equipment to you in a short time. The Niagara Aero Heat Exchanger saves nearly all of the water consumed by conventional cooling methods.

For the complete story of other benefits and savings, write for Bulletin 96.

NIAGARA BLOWER COMPANY

Over 35 Years Service in Industrial Air Engineering

Dept. S, 405 Lexington Ave. New York 17, N. Y.

Experienced District Engineers in all Principal Cities of U. S. and Canada

LETTERS
TO THE EDITORS

The Big Question Remains

Your editorial, "Unneeded, Unwanted," in the Mar. 10 issue of your esteemed publication, STEEL, has come to our attention.

The figures on the Commerce Department which you cite were originally circulated over a year ago; and they give a false picture of the growth of the Commerce Department.

Expenditures of the Department were $75,116,535 in fiscal 1940, and $863,082,852 in fiscal 1950. Neither the Maritime Administration nor the Bureau of Public Roads was in the Department in 1940; their combined budgets accounted for $570 million of the increase in the Department's total by 1950.

The balance of the increase was due, in large measure, to special activity in the fields of census-taking, airport construction and safety, and export control.

Nils A. Lennartson
Department of Commerce
Office of the Secretary
Washington

Your Mar. 10 issue of STEEL, carrying the editorial "Unneeded, Unwanted," (p. 73) reached my desk the same morning I received the attached communication (announcement of a nationwide suggestion system of safety, cost-reducing techniques or time-saving devices) from the Secretary of Commerce.

One cannot help wonder as to the size of the organization that will be required to run this suggestion program for the Commerce Department. One also wonders how many business people will fall in with the idea, and to what extent the activity will really assist industry.

The same day I also received the attached communication (announcement of weekly courses in Civil Defense at the Staff College of the Federal Civil Defense Administration). Here, again, is an extensive program that will undoubtedly require a large organization to handle and, again, one could well ask whether such assistance to industry is either necessary or in any way justified.

I believe your warning is well taken and very timely.

W. P. Dudley
Secretary-treasurer
Ohio Steel Foundry Co.
Lima, O.

No Longer Available

Will you please send me five copies of "Guide for Steel Buyers" (Jan. 15, 1951, p. 37).

G. L. Anderson
Iron and Steel Division
National Production Authority
Washington

● *Sorry but this special report is out of print.*

another reason why J&L turret lathes produce { *MORE CHIPS PER TOOL*
MORE PIECES PER HOUR
MORE PROFIT PER JOB

MORE COOLANT ON CUTTING TOOLS!

An outstanding, standard feature of all J & L turret lathes is the *automatic, continuous* flow of coolant *through the working face of the hexagon turret* directly onto the tools and work. Tapped holes are also provided on top of the turret for additional pipe connections. This guarantees a copious supply of coolant where and when it is needed, regardless of the position of the turret or the length of the work —a necessity for best tool life.

P.S. You should know the other J & L features. Write to Dept. 710 for Catalog.

"World's most accurate and powerful turret lathes"

RAM TYPES: Bar, 1½" to 4½", Chuck, 10" to 12". SADDLE TYPES: Bar, 2½" to 5", Chuck, 12" to 18".

JONES & LAMSON

Machine Tool Craftsmen Since 1835

JONES & LAMSON MACHINE CO., Springfield, Vt., U.S.A. J&L TURRET LATHE DIV.

TORRINGTON FINDS *Udylite* MACHINE IS A TRIPLE-THREAT TO PRODUCTION COSTS

1

THREE PEOPLE DO WORK FORMERLY DONE BY EIGHT

2

MORE UNIFORM PLATING WITH REDUCED HANDLING

3

IMPROVED WORKING CONDITIONS FOR EMPLOYEES

● Here's graphic proof that Udylite can show you the way to better plating at lower cost. The Torrington Manufacturing Co., Torrington, Conn., has realized all these benefits with a Udylite Full Automatic Plating Machine in their Air Impeller Division plant. The machine is used in processing blower wheels for use in cooling military electronic equipment.

There are countless other ways that Udylite Plating machines pay their way, in addition to the ones above. For example, their compactness requires less floor space; their rugged construction and clean design result in negligible maintenance costs. They are extremely versatile and it is a simple matter to modify them for virtually any metal finishing process. Your Udylite Technical Man can give you dozens of instances where Udylite Machines are paying for themselves with increased production and lowered overhead. Call him today or write direct for complete information.

THE *Udylite* CORPORATION
DETROIT 11, MICHIGAN

What's wrong with this picture

● Nothing at all! But chances are any veteran shop man will instantly ask, "What's the idea of having an 'Automatic' in the turret lathe department?"

The "idea" is simply this: Warner & Swasey 1-AC Single Spindle Automatics can handle many of your regular small and medium lot runs *more profitably* than your hand-operated machines.

That's because the 1-AC operator can change setups quickly for the job at hand. There are no cams to change—he simply re-adjusts trips for feed, speed and stroke controls. And, on certain jobs, one man on a 1-AC can turn out more work, of more uniform accuracy, than two men on hand-operated machines.

To find out whether 1-AC Single Spindle Automatics fit into your production picture, call in your nearest Warner & Swasey Field Representative. He'll study your jobs and methods and advise you correctly.

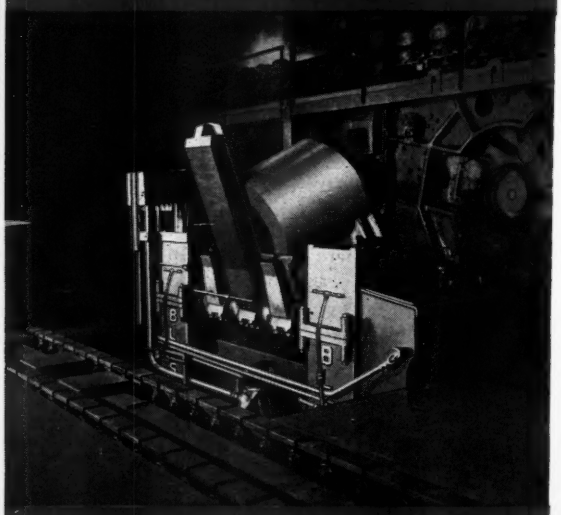
WARNER & SWASEY
Cleveland

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES

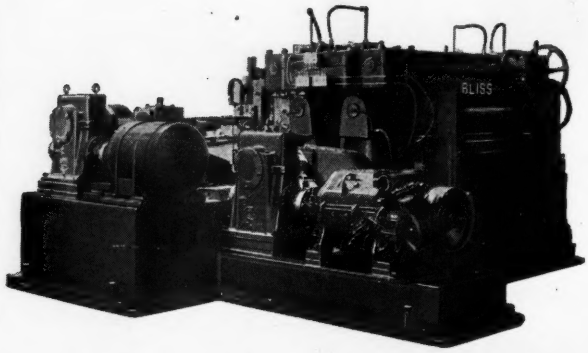
HOW BLISS DESIGNS FOR STEEL, BRASS

PRIMARY METAL PLANTS use hundreds of Bliss special-purpose machines in conjunction with hot and cold reduction mills. In every case, backed by field research with industry's engineers, Bliss has drawn upon its engineering skills to create equipment combining the necessary ruggedness and precision for the job at hand.

Pictured on these pages are typical exam-

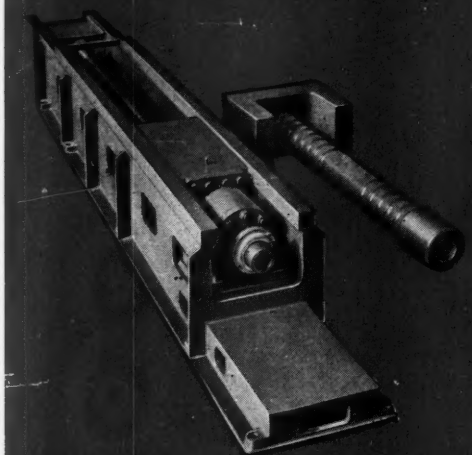


COIL UPENDER strips hot 25,000-pound coils from the Mandrel Coiler, upends and deposits them on a "waffle top," which in turn deposits coils on the moving conveyor cradles without damage to coil edges.



13 ROLL BREAKER produces scale-free and inclusion-free product which is suited for final reduction operations.

RUN OUT DELIVERY TABLE specially designed by Bliss has slab sweep-off sections opposite piler. A slab pusher is provided on one side.



ROLL CHANGER WITH SLIDING RAIL permits easy roll removal from the mill and reduces required crane capacity. Balance bar is used to handle work roll assemblies including chocks and bearings.

AUXILIARY EQUIPMENT AND ALUMINUM MILLS

ples of mill accessory equipment designed by Bliss. The complete range is described and illustrated in a new 52-page brochure soon to be published. You can reserve your copy now.

Next time you need auxiliary mill equipment, call in Bliss engineers.

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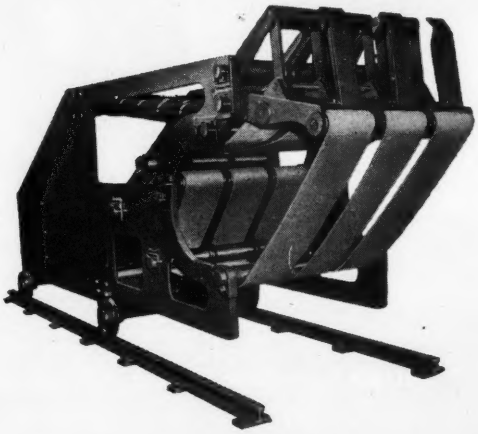
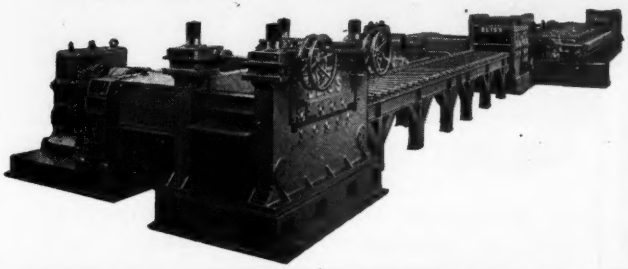
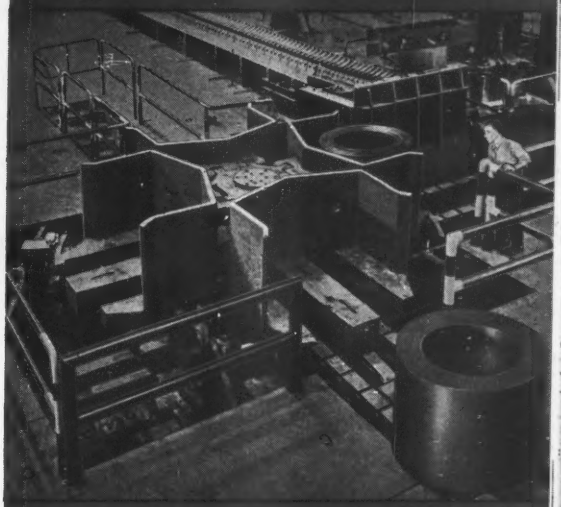
PRESSES, ROLLING MILLS, SPECIAL MACHINERY



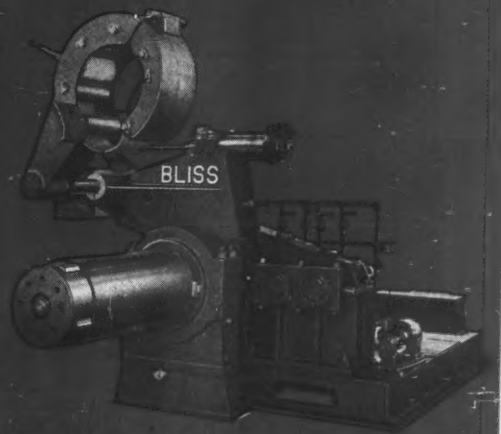
WIDE HORIZONTAL-TYPE BELT WRAPPER **is used in conjunction with Tension Reel to coil strip on the fly into tight, uniformly wound coils.**



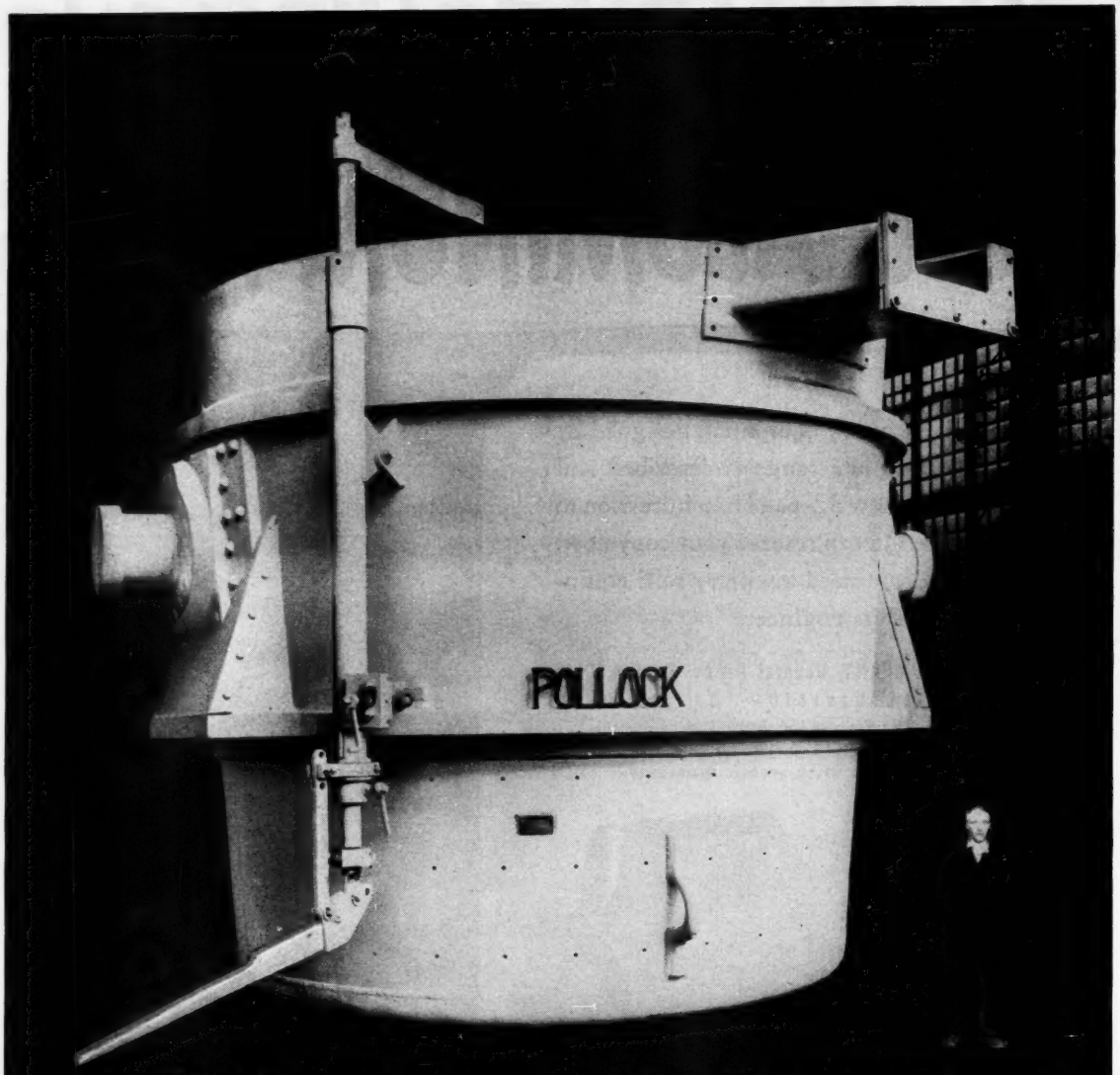
COMBINATION LEVELER AND SLAB MILLER **levels the slab, mills one side, turns the bar over and mills the other side. It is used in brass and aluminum mills to prepare metal for final**



COIL LIFT AND TURN-AROUND UNIT transfers coils weighing up to 30,000 pounds from one leg of conveyor to another. It operates at either 90° or 180°. Perfect coil edges are retained.



TENSION REEL AND BELT WRAPPER handles 30,000-pound coils. Forced-circulation oil lubrication pump and piping are shown clearly on the typical Bliss gear reduction unit.



Over 600 **POLLOCK** welded Open Hearth ladles in capacities ranging from 15 to 300 tons are being used by major steel companies in the United States and Canada.

The welded ladle was introduced by **POLLOCK** in 1932 and the advantages over heavier, riveted types were recognized immediately.

Lighter weight and smoother inside and outside surfaces add to their importance.

POLLOCK welded ladles are custom designed to suit existing plant conditions. Construction details of spouts, stopper holes, stopper riggings, etc., are detailed to meet specific requirements.

POLLOCK
Since 1863
BLAST FURNACES • HOT METAL CARS AND LADLES
CINDER AND SLAG CARS • INGOT MOLD CARS
CHARGING BOX CARS • WELDED OPEN HEARTH LADLES

THE WILLIAM B. POLLOCK COMPANY
YOUNGSTOWN, OHIO
STEEL PLATE CONSTRUCTION • ENGINEERS
FABRICATORS • ERECTORS

FLAT SPRING STEEL

No more waiting! Roebling's expanded facilities can meet your needs right now!

PROMPT! FAST! . . . that's the sort of deliveries you can count on now for Roebling high carbon flat mechanical spring steel. For many years Roebling has had one of the largest specialty mills in the country and today's expanded facilities have boosted production to new highs.

Roebling flat spring steel is made as you want it . . . annealed, hard rolled untempered; scaleless tempered; tempered and polished, blue or strawed. And from open hearth to finished product, Roebling positive control assures uniform quality . . . saves preparation time for users . . . brings faster, smoother production.

Roebling is ready to furnish flat spring steel with the exact mechanical properties required for any special type of application. Write or wire now for full information. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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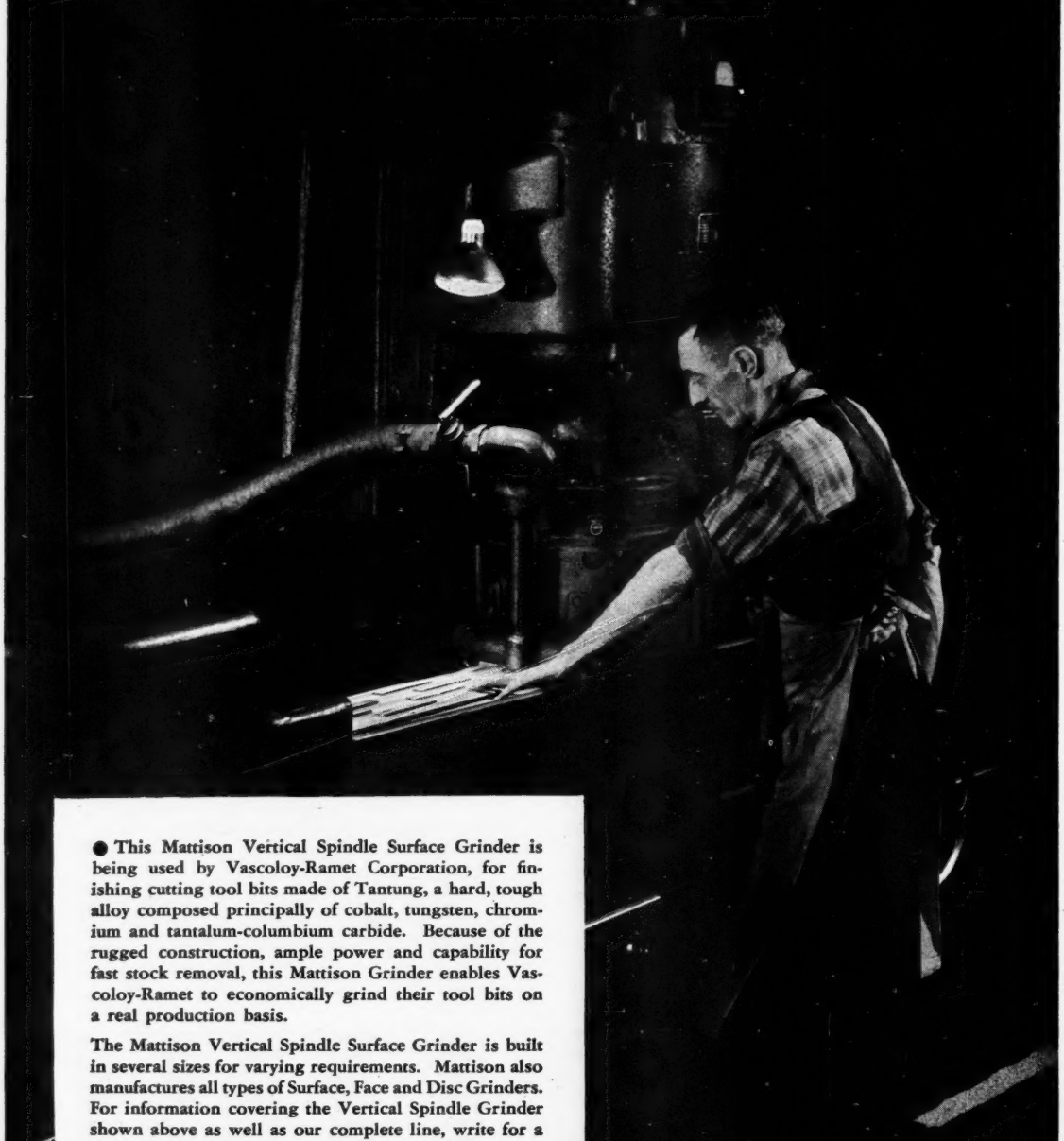
MATTISON VERTICAL SPINDLE SURFACE GRINDER



● This Mattison Vertical Spindle Surface Grinder is being used by Vascoloy-Ramet Corporation, for finishing cutting tool bits made of Tantung, a hard, tough alloy composed principally of cobalt, tungsten, chromium and tantalum-columbium carbide. Because of the rugged construction, ample power and capability for fast stock removal, this Mattison Grinder enables Vascoloy-Ramet to economically grind their tool bits on a real production basis.

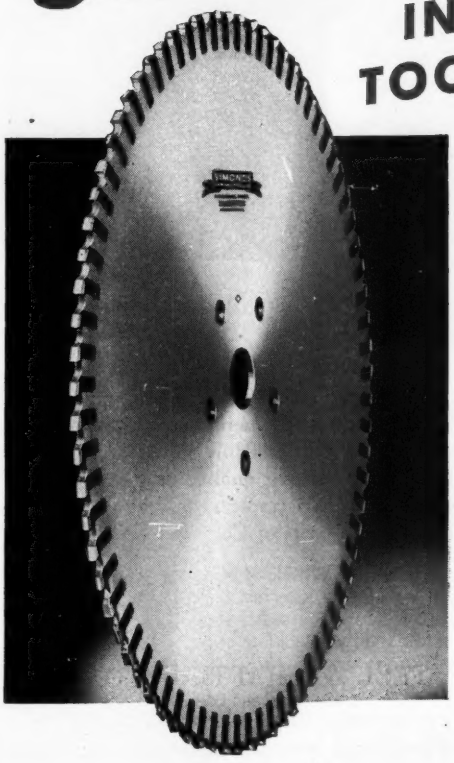
The Mattison Vertical Spindle Surface Grinder is built in several sizes for varying requirements. Mattison also manufactures all types of Surface, Face and Disc Grinders. For information covering the Vertical Spindle Grinder shown above as well as our complete line, write for a free copy of our general catalog No. 1901RM.

MATTISON MACHINE WORKS

ROCKFORD · ILLINOIS

A Wedge for every tooth means Added Strength for SIMONDS

INSERTED-TOOTH SAWS



Here's the most rugged design of all metal-cutting saws . . . the tough saw-plate of special Simonds Steel, fitted with alternating square and beveled inserted teeth . . . *and with a wedge for every tooth*, to give that extra strength for heavy cutting. In fact, this saw *is* practically indestructible, for it can be readily repaired if damaged and restored to original efficiency by an average mechanic.

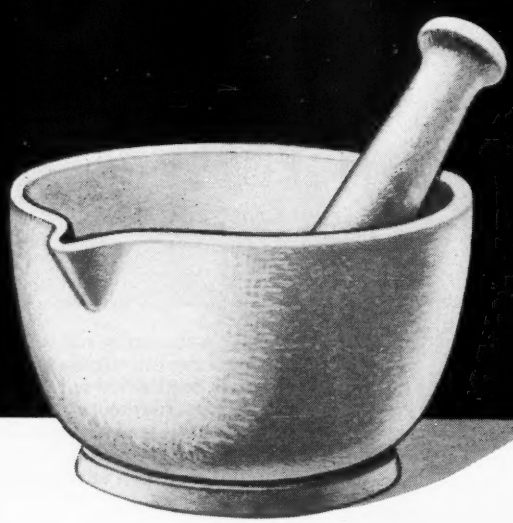
Yet Simonds Inserted-Tooth Saws have the same quick clearance as other Simonds Saws . . . and the inserted teeth cut a "Tri-vided" chip that falls free in 3 pieces.

For general heavy-duty work, this is *Industry's No. 1 Saw.* And for other types of work, Simonds also makes Circular Metal Saws in Segmental, Solid-Tooth and Carbide-Tipped types. So ask your Industrial Supply Distributor to secure for you the *unbiased* consulting of a Simonds Saw Engineer.

SIMONDS
SAW AND STEEL CO.

Factory Branches in Boston, Chicago, San Francisco and Portland, Ore.
Canadian Factory in Montreal, Que.

The ONE *ingredient you can't do without*



In mass-production systems, which is where most of our products are used, no production rate or cost schedule will stand up unless you can count on absolutely consistent quality in your materials. That you *must* have, and there is a tradition of craftsmanship in our plants which has protected users of Columbia and Summerill products for a great many years.

Columbia STEEL & SHAFTING COMPANY

SUMMERILL TUBING COMPANY DIVISION

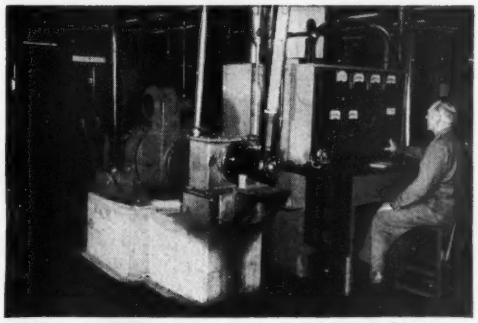
PITTSBURGH 30, PENNSYLVANIA

W&D 4067

SPECIALIZING IN COLD FINISHED STEEL BARS and SEAMLESS STEEL TUBING

GENERAL MILLS, INC. picked G-E *Thy-mo-trol** drives to proportion and control flow rate of flour. They wanted stepless, very accurate, electronic speed control over a wide range, plus quick, easy operation. The answer: *Thy-mo-trol*, available in ranges to 100:1 and more, ¼ h.p. and up. Above, operator gets orders over phone, sets drive speed quickly by turning dial.

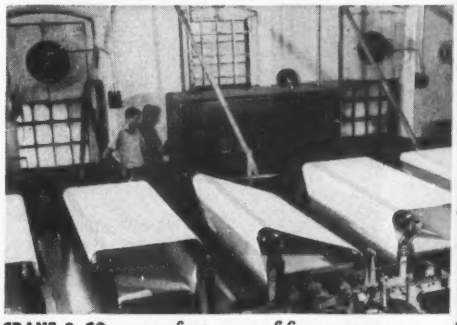
Why four plants chose four different G-E Adjustable-Speed Drives!



JACK & HEINTZ, INC. chose G-E *Speed Variators* because they wanted to increase production with rotating, adjustable-speed drive that could be operated from centralized control—still maintain good quality over a wide speed range.

◀**BUTTERICK CO. INC.** found G-E *ACA Motors* ideal for varying speeds over moderate range for offset presses. Here is the simplest, low-cost way to get stepless, adjustable-speed drive with a-c power, contains motor, control in one compact unit.

*Reg. Trade-mark of General Electric Co.



CRANE & CO., manufacturers of fine paper, selected G-E *Electronic Speed Variators* for paper machines—needed a 40 h.p. adjustable-speed drive that maintained rigid quality control, automatically, 24 hours a day, six days a week.

GENERAL ELECTRIC CO. is the only manufacturer making *all major types* of electric adjustable-speed drives to help you speed output, raise quality. Write for 24-page *Bulletin GEA-5334. General Electric Co., Schenectady 5, N. Y.* 646-18

GENERAL ELECTRIC

No ONE chain serves every purpose

LINK-BELT offers the right chain

. . . engineered for your requirements

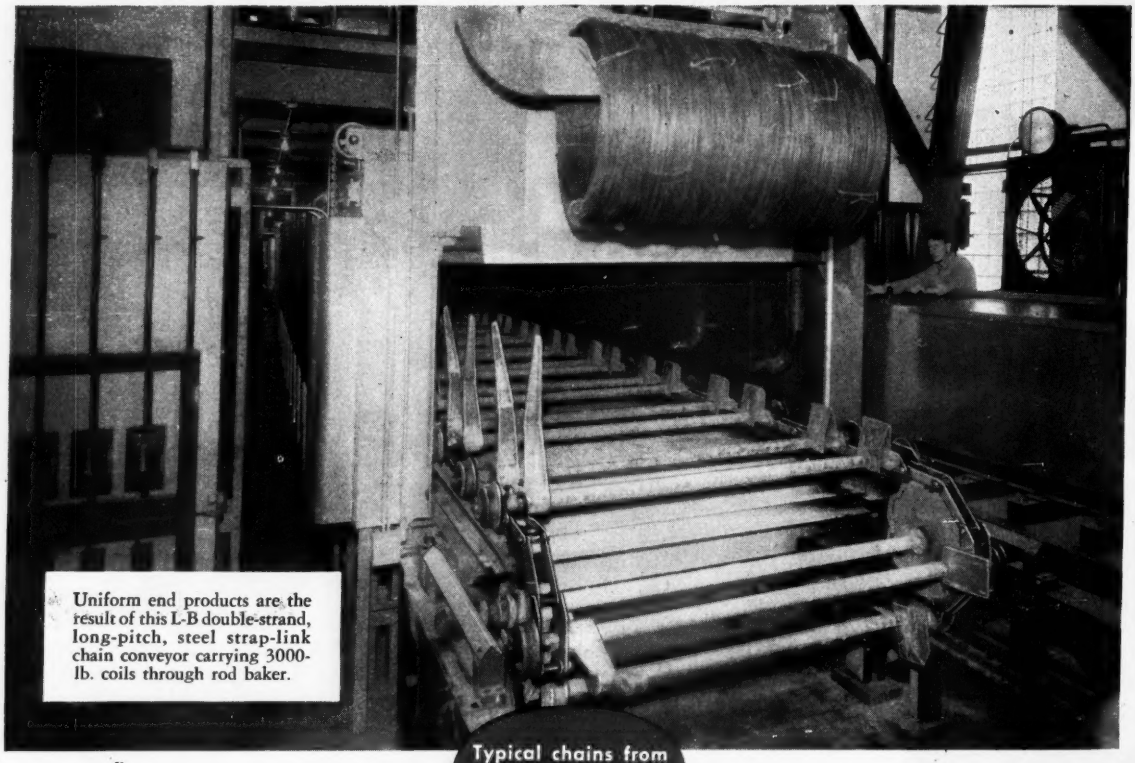
Don't settle for a "cure-all" chain to handle every job. Different types of chain have different characteristics. That's why Link-Belt makes a complete line of chains. Our engineers can recommend the correct type of chain to fit your particular needs . . . the one that does your job best.

Equally important is your assurance that *any* chain with the Link-Belt name will give you longer chain life. Accurate control of raw materials and processes . . . plus manufacturing refinements add up to the highest standards.

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia). Offices, factory branch stores and distributors in principal cities. 12,781

LINK-BELT

CHAINS AND SPROCKETS



Uniform end products are the result of this L-B double-strand, long-pitch, steel strap-link chain conveyor carrying 3000-lb. coils through rod baker.

Typical chains from the complete LINK-BELT line

Class SS bushed roller chain with straight sidebars —for practically any conveying or elevating service.

Class C combination chain — popular, durable, low cost design for elevators and conveyors.

Class SS bushed roller chain with offset sidebars —for heavy drive service at moderate speeds.

Transfer chain with tilting dogs—for plate and slab travel, loads up to 300,000 pounds.

"I wonder what happened to me !", said Alice

ALICE in Wonderland ate the magic cake and grew until she was more than nine feet tall. Our National bureaucracy also seems to have partaken of the magic cake of power. Bureaus in our government have grown in number and scope until their activities now control, to a great extent, the lives of all individual Americans. Department after department adds more and more people -- state, justice, commerce, treasury -- not to mention those sprawling emergency born agencies of price control, N.P.A. and other alphabetical subdivisions.

The number of employees of our federal, state and local governments continues to grow. During many recent months, personnel was added to the federal payroll at the rate of 1,500 daily.

What is the reason for this mushrooming? The Korean War? Threat of war in Europe, Southeast Asia, or the Middle East? Obviously not! A glance at the federal budget gives the answer. The estimated cost of all governmental functions for the fiscal year 1952 is in excess of 70 billions of dollars, an increase of 26 billions, or approximately 60% more than last year.

When will it end? Only you, the individual citizen, who carries the bureaucratic load on his back, can stop it. It will end when enough patriotic men and women demand from congress that the Washington Wonderland start shrinking back to reasonable proportions.

YOUR SCRAP YOUNGSTOWN IS NEEDED

The Youngstown Sheet and Tube Company

General Offices -- Youngstown 1, Ohio

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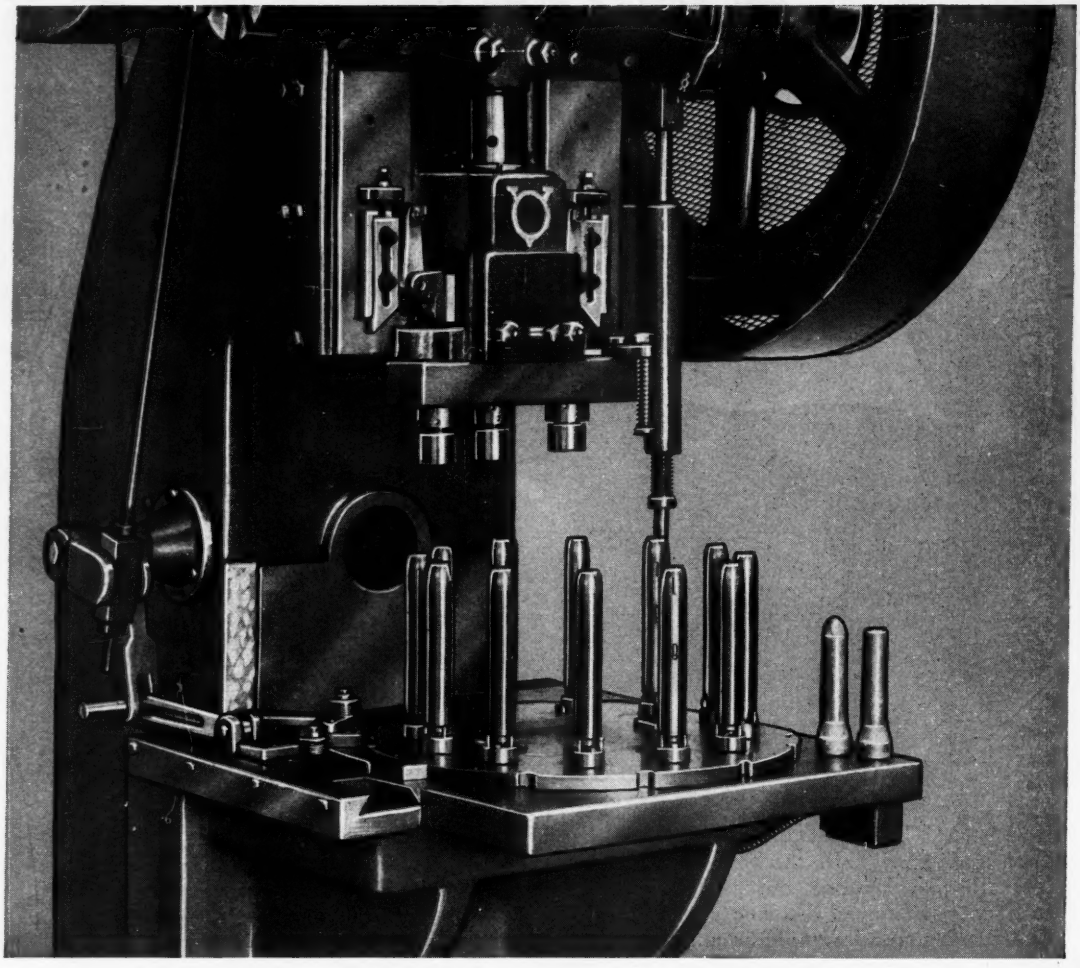
MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

The steel industry is using all its resources to produce more steel, but it needs your help and needs it now. Turn in your scrap, through your regular sources, at the earliest possible moment.

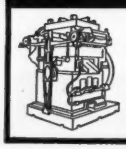
300% More Production



This Production Increase was obtained by the Blake Manufacturing Company, Clinton, Mass., on a pointing operation on flashlight cases. Under the old method, Blake employed two presses and two operators for this job. Pieces completed by the two men averaged 32 per minute, or 16 per man. With the V & O Dial Feed, one man operating one press produces 48 per minute, for an increase of 300% in per press production. It was also possible to add a third operation to improve the finish of the case and reduce rejects.

The Dial Feed designed and built for this manufacturer is typical of the tooling available at V & O. More and more manufacturers have come to realize that automatic feeds of the dial type boost production rates, conserve manpower and greatly simplify operator motions. V & O does the complete job for you on Dial Feeds, from initial design through manufacture. You get a complete package.

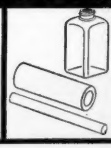
OTHER EMHART PRODUCTS INCLUDE:



HIGH SPEED AUTOMATIC PRESSES
HENRY & WRIGHT
Division of Emhart Mfg. Co.
HARTFORD 5, CONNECTICUT

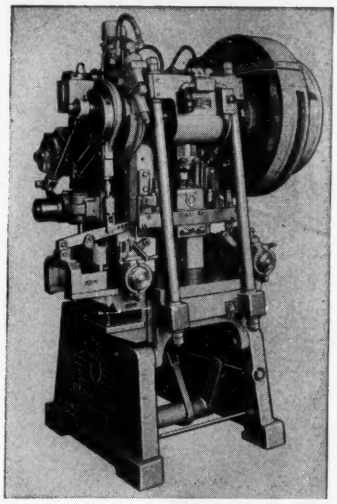
GLASS MAKING MACHINES
HARTFORD-EMPIRE CO.
Division of Emhart Mfg. Co.
HARTFORD 2, CONNECTICUT

AUTOMATIC PACKAGING EQUIPMENT
STANDARD-KNAPP
Division of Emhart Mfg. Co.
PORTLAND, CONNECTICUT

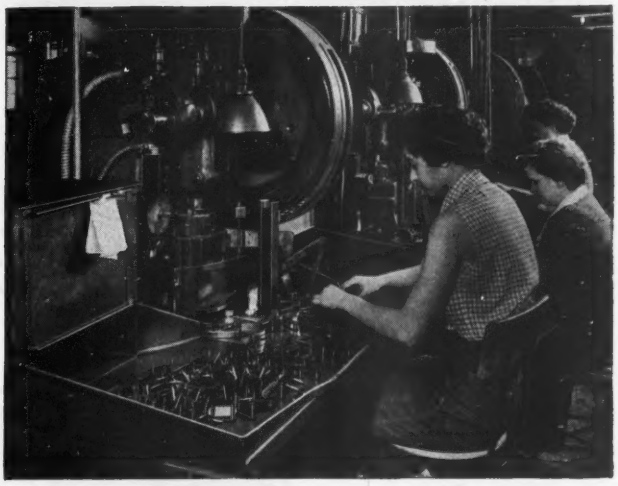


PLASTIC BOTTLES, RODS, TUBES, SPECIAL SHAPES
PLAX CORPORATION
Subsidiary of Emhart Mfg. Co.
HARTFORD 1, CONNECTICUT

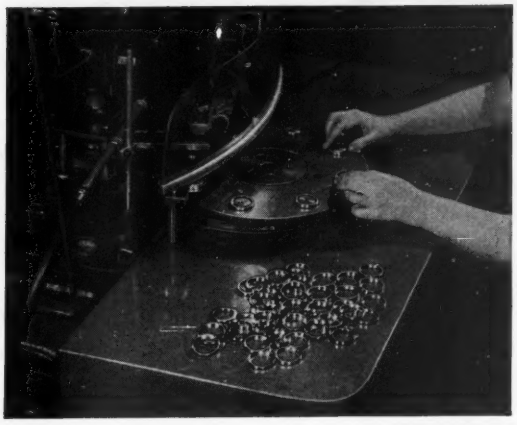
Per Press with V&O Dial Feed



V & O High Speed Precision Presses with air clutch are available for high speed stamping operations. Machines are designed for maximum rigidity and minimum vibration. They have the traditional V & O long slide and fine machine tool workmanship, plus such added advantages as heavier over-all weight, more bed area, wider and heavier flanged slide, and numerous other advanced features.



Assembly of Roller Chain (type C-2060) is accomplished on this battery of V & O Presses at Baldwin-Duckworth Division, Chain Belt Co., Springfield, Mass. Machines in this group are 10-ton capacity. A 50-ton V & O Press (not shown), with an automatic coil feed, is used to blank #50 roller link plates.



Over 400% Increase in production on a secondary die operation resulted when a V & O Feed-O-Matic® was installed by Eclipse Pioneer Plant, Division of Bendix Corporation, Teterboro, N. J. Use of this power press feeder cut the time required for each piece from .210 of a minute to .046 of a minute—a saving of .164 of a minute per piece.

Only the best is good enough

DESCRIPTIVE CATALOGS Catalogs containing complete specifications and operating details on V & O Precision Power Presses and Feeds are available. Please write The V & O Press Company, 381 Union Turnpike, Hudson, N. Y.

THE V & O PRESS COMPANY
Division of Emhart Mfg. Co.
BUILDERS OF PRECISION POWER PRESSES
AND FEEDS SINCE 1889
HUDSON NEW YORK

HAYNES alloy No. 25 Harnesses Jet Exhaust at over 2,000°F.

The hottest part of the afterburner (left) is made from HAYNES alloy No. 25 to resist high stress, corrosion, and operating temperatures of more than 2,000 deg. F.

Jet exhaust gases that reach temperatures of more than 2,000 deg. F. and speeds as high as 1,800 m.p.h. are easily handled by the new HAYNES cobalt-base alloy No. 25. In fact, this alloy was one of the few commercially available materials that could even be considered for the hottest parts of the afterburner pictured here.

The afterburner is installed behind the jet engine and increases the thrust of the plane by burning fuel with the unused oxygen in the turbine exhaust. Finding an alloy that would stand up under the heat and stress of this operation was really a tough problem. The material had to be strong at high temperatures and resistant to the oxidizing action of the corrosive exhaust gases. In addition, it had to be capable of fabrication by drawing, forming, and welding.

HAYNES alloy No. 25 has a unique combination of all these properties. For complete information on this alloy, write for the 12-page booklet, "HAYNES Alloy No. 25."

HAYNES TRADE-MARK *alloys*

"Haynes" is a trade-mark of Union Carbide and Carbon Corporation.

Haynes Stellite Company
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EBCo-built *U.S.S. Perch* in maneuvers off Alaska. Official U.S. Navy photo.

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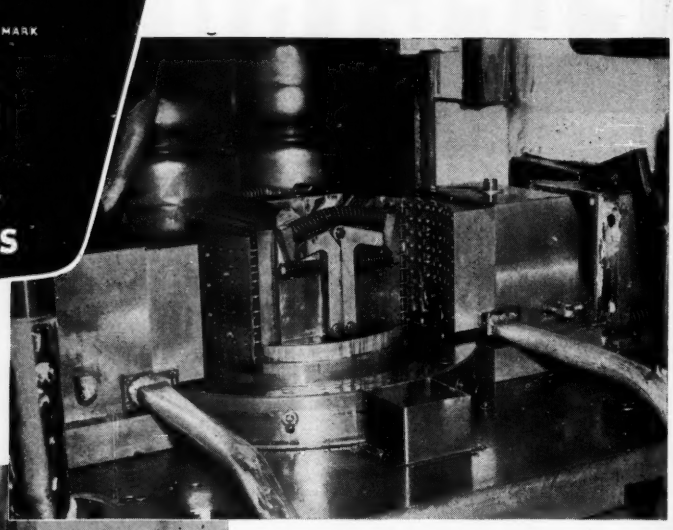
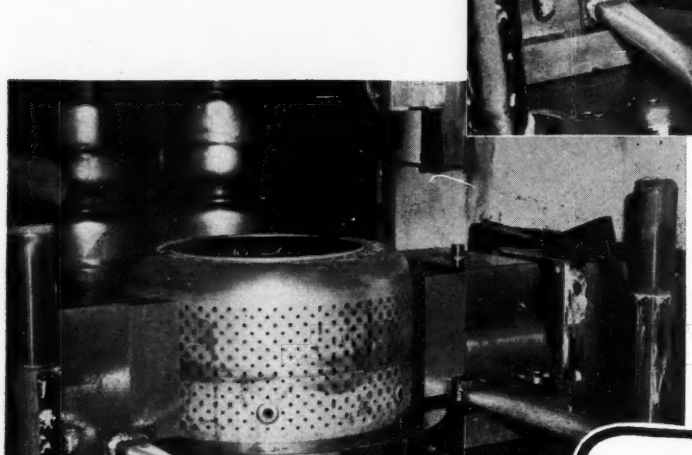
In tooling, too . . .

TRADE **Verson** MARK

Engineering Pays Big Dividends



Close-up of the indexing and piercing die before inserting the tub.



The tub at completion of the six stroke cycle that punches the 1035 holes.

THIS Verson indexing and piercing die punches 1035 holes from the inside out in Maytag washer tubs . . . in 6 consecutive automatic press strokes it performs operations that formerly required 4 horning presses.

Verson engineers will be pleased to discuss with you tooling related to presses and press brakes; just send an outline of your requirements. Also available is the Verson Die Manual which gives full details on Verson dies for press brakes. If you do not already have a copy of this helpful manual, write for a copy. There's no obligation.

Originators and Pioneers of Allsteel Stamping Press Construction

VERSON ALLSTEEL PRESS COMPANY

9318 South Kenwood Avenue, Chicago 19, Illinois — **So. Lamar at Ledbetter Dr., Dallas 15, Texas**

A VERSON PRESS FOR EVERY JOB FROM 60 TONS UP

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING
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with an Extra Fine REPUTATION

● The wire you need in any fine-wire application is an important product-part. To save you time and money . . . and to help you turn out better merchandise, Continental backs up its enviable fine-wire reputation with honest, helpful service. You have only to tell us your problem, and we will recommend or make the wire you need. Continental has a satisfied-user record built by years of giving service with every wire sale. You'll like Continental and Kokote wire and, like so many other users, you'll appreciate Continental wire service. Write us at Kokomo, Indiana about your wire problem.

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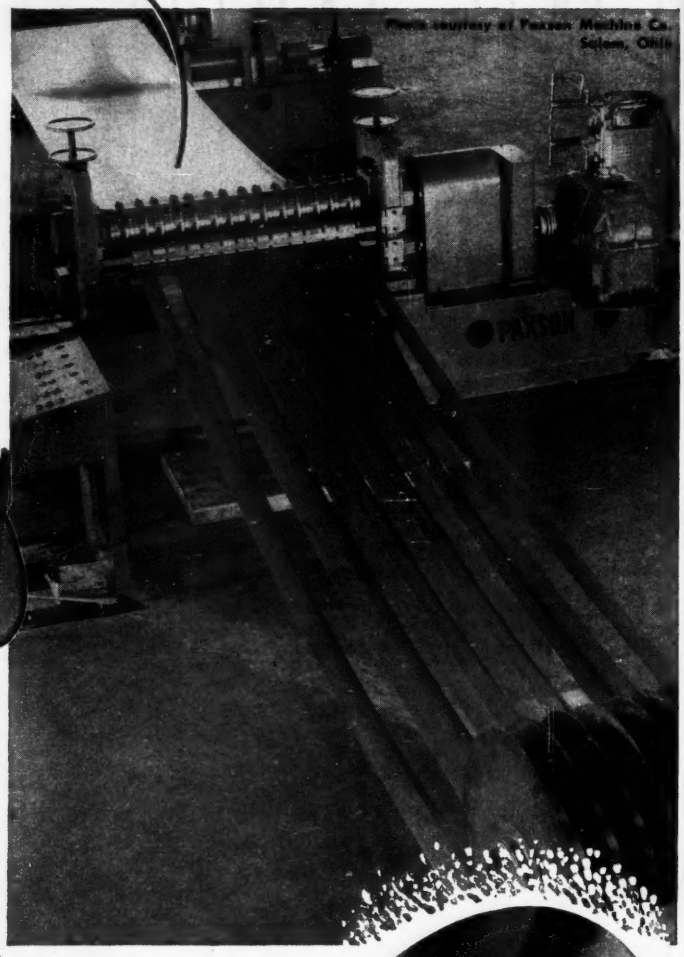
CONTINENTAL STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF *Manufacturer's Wire* in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

it's OK let 'er go!



the gang's all here

. . . ready to knock down production costs—because OK Gang Slitter Knives run hour after hour without re-grinding giving you top machine productivity at all times. Here's why: exact metallurgical specifications for our steel—an exclusive heat treating process to give uniform hardness and temper —special grinding and finishing to tolerances of ± .00025 or finer.

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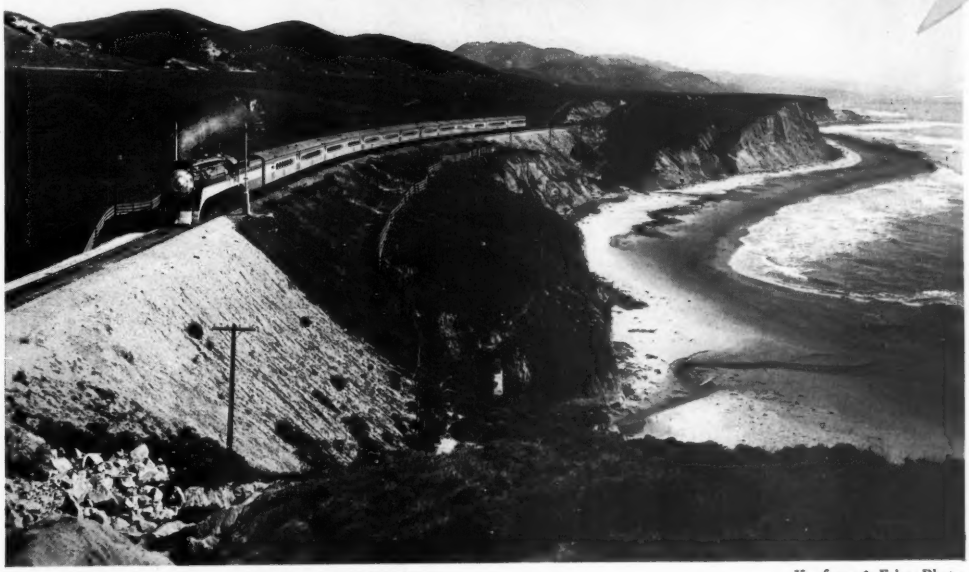
BULLARD

MANUFACTURERS OF MACHINE TOOLS



Southern Pacific Line between Los Angeles and San Francisco

Kaufman & Fabry Photo

The Invisible Background of Industrial Progress

In August of 1829 one of the first Steam Locomotives in the United States made its initial run from Carbondale to Honesdale, Pennsylvania. In 1886, two railroad lines joined, making the first transcontinental link between the East and West Coasts. These historical events promoted rapid development of business enterprises throughout the country.

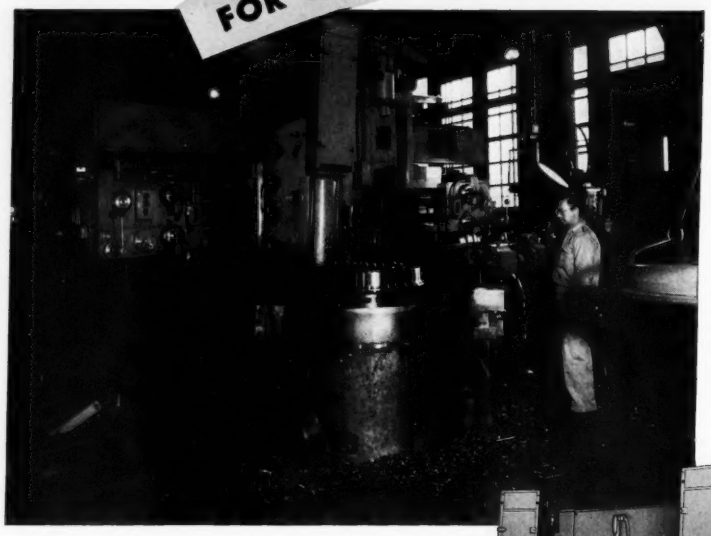
Today American railroads, a major element of our transportation systems, occupy a key position in national and defense economy. . . With a total of 400,000 miles of track, 227,244 of which are in operation, American railroads account for about 29% of the world track mileage. All rolling stock comprising approximately 45,000 locomotives, 40,000 passenger cars and 1,785,000 freight cars if placed end-to-end, would extend nearly three quarters around the world. . . As manufacturers of ★ *Modern Machine Tools,* we are justly proud of our part in the building and maintenance of the American railroad system with its many supply and allied industries. Machine Tools — together with American free enterprise, keen foresight and competition — set the pattern for industrial and economic development.

THE BULLARD COMPANY

BRIDGEPORT 2
CONNECTICUT

★ *For greater manufacturing economy REFER to next page*

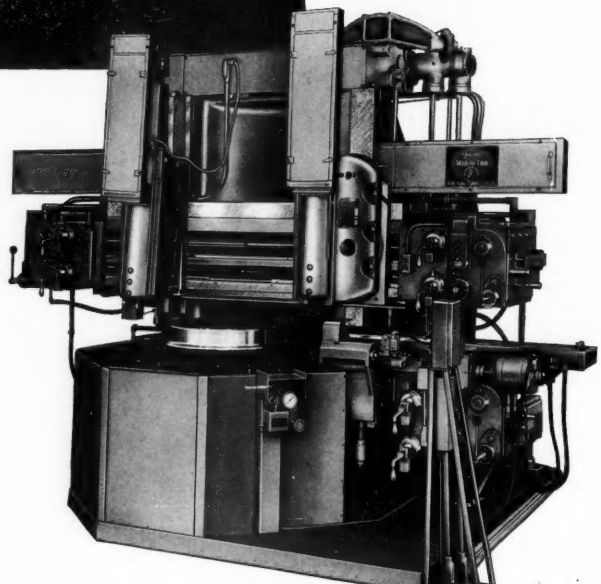
BULLARD MACHINE TOOLS
FOR GREATER MANUFACTURING ECONOMY



Man-Au-Trol Vertical Turret Lathe has proved itself as a practical manufacturing unit for Car Wheels and Diesel Locomotive Wheels. Several installations of the 54-inch Car-Wheel machine are proving most satisfactory from the Economical and Production angle.

Where Car Wheels are machined for distribution to car builders and railroad repair points, the Car Wheel Man-Au-Trol Vertical Turret Lathe is a highly efficient manufacturing unit.

On Diesel Locomotive Wheels, at three times the former output, the Man-Au-Trol two-head machine is doing a remarkable job. Furthermore, the same machine by the flick of one lever is ready for manual operation on another type of wheel without having disturbed the automatic cycle setup. Such flexibility in a machine opens up a wide variety of applications.



Bullard Man-Au-Trol Vertical Turret Lathe — another step toward Greater Manufacturing Economy. Built in 30-, 36-, 42-, 54-, 64-, and 74-inch sizes.

BULLARD

THE BULLARD COMPANY

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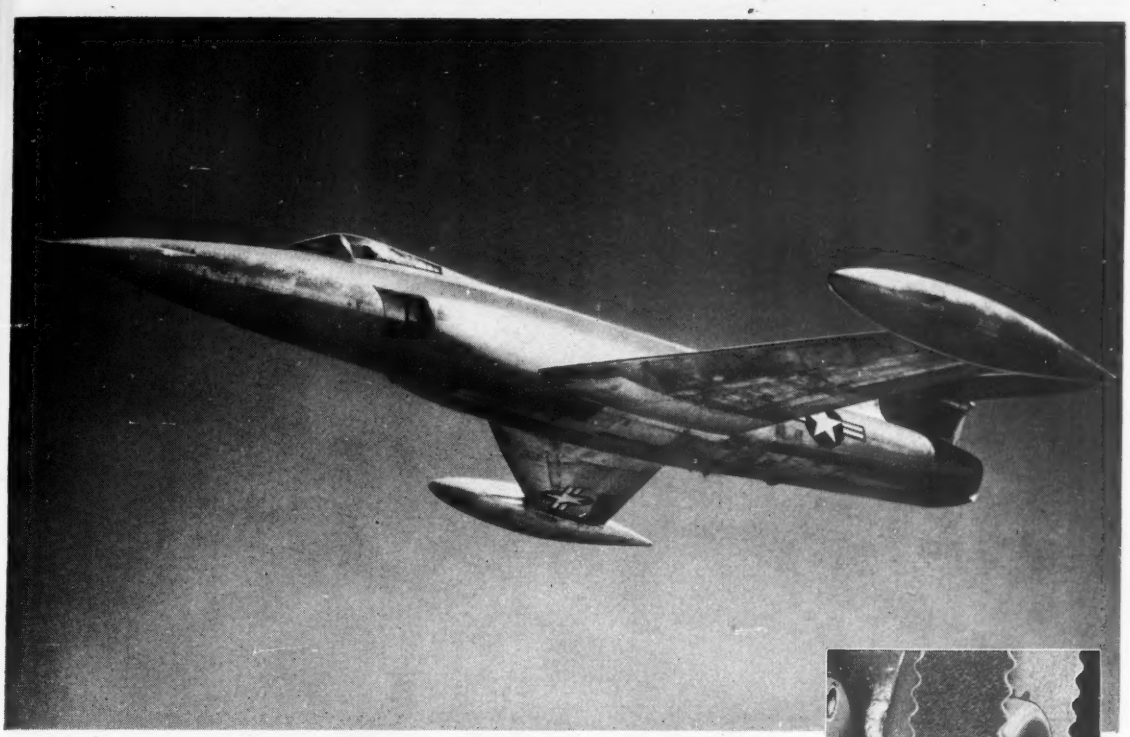
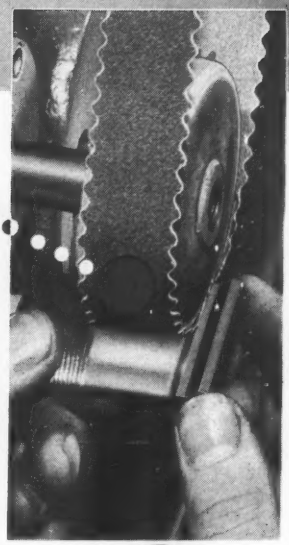


New *Scallop-Edge* belt... speeds jet production



CRACKING A PRODUCTION BOTTLENECK for the jet aircraft industry was the job assigned 3M Methods Engineers. Critical assembly work was held up because finishing the jet blades required a two-step operation. 3M solution: a new "Scallop-Edge" Abrasive Belt that conforms to small radii, enables machine to grind jet blade and root in one swift operation. Result: Two operations reduced to one; end of bottleneck!

PROBLEMS LIKE THESE are met and solved by 3M for countless grinding and finishing jobs. Sometimes this 3M team comes up with an entirely new type of abrasive. Often, a solution is found in a better way to use standard material. But—one way or another—they've helped a lot of manufacturers solve tough grinding problems. And they're ready to help you solve *yours*, too. Use the convenient coupon for information.

Another 3M COMPANY PRODUCTS first

3M CAN HELP YOU SOLVE *YOUR* GRINDING PROBLEMS! Dept. ST552

Write today for complete information on 3M Methods.
Address Minnesota Mining & Mfg. Co., St. Paul 6, Minn.

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Made in U.S.A. by MINNESOTA MINING & MFG. CO., St. Paul 6, Minn.—also makers of "Scotch" Brand Pressure-sensitive Tapes, "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-slip Surfacing, "3M" Adhesives. General Export: 270 Park Avenue, New York 17, N. Y. In Canada: London, Ont., Can.

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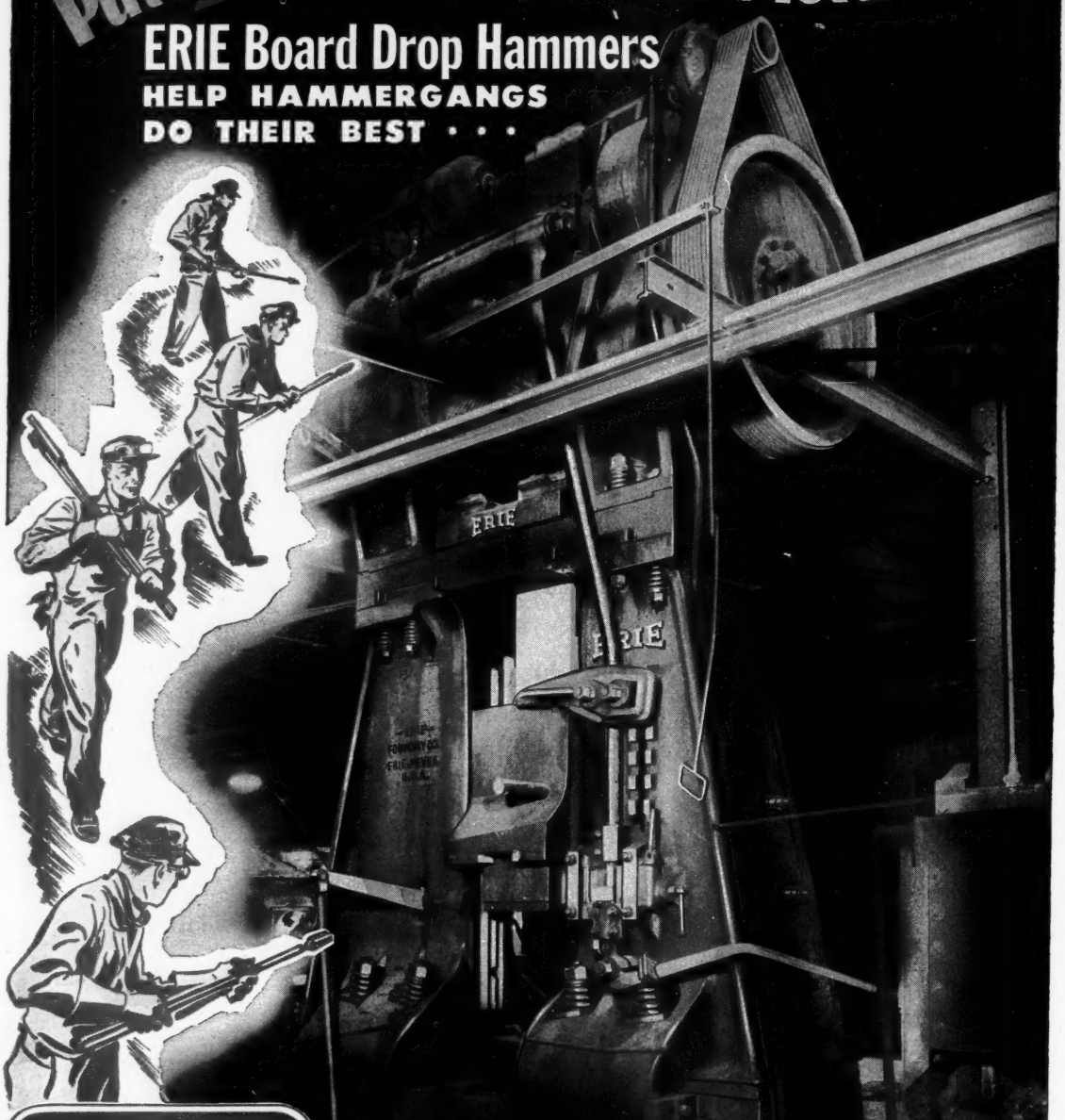
ERIE Board Drop Hammers

HELP HAMMERGANGS DO THEIR BEST · · ·



ON ERIE HAMMERS ALL STRESSED PARTS, UPPER WORKS, FRAME AND ANVIL ARE STEEL.

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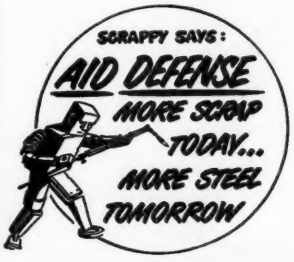
If you want STEEL tomorrow

Iron and steel scrap is needed now to meet both defense and domestic demands for new steel. You can help America—and yourself—by organizing a plant-wide scrap drive today.

America's steel mills are presently producing in excess of 100 million ingot tons annually, *but* the scrap on hand is nowhere near sufficient to maintain this vitally needed volume.

Your cooperation in helping to build up the supply of scrap is earnestly requested.

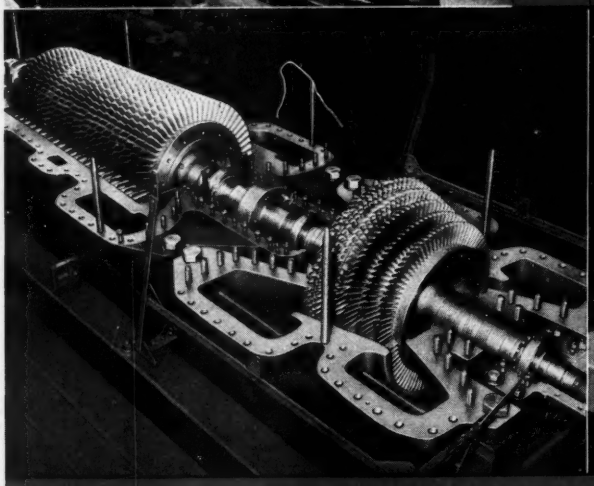
Comb your plant and yards for dormant iron and steel; collect it, and call in your local scrap dealer. Do it now! Every pound of scrap collected will help secure the future.



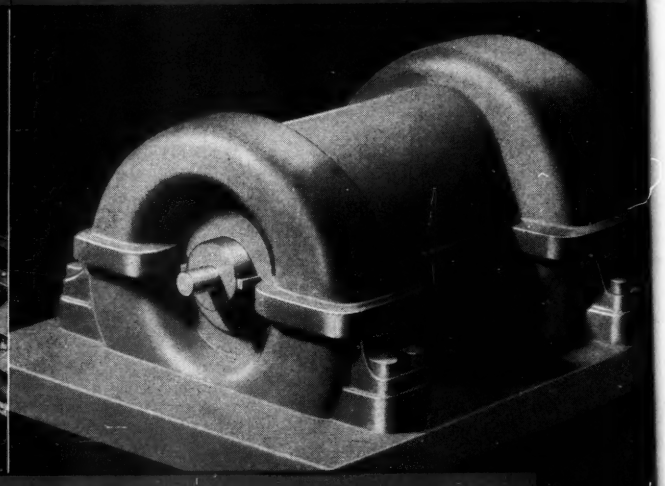
WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

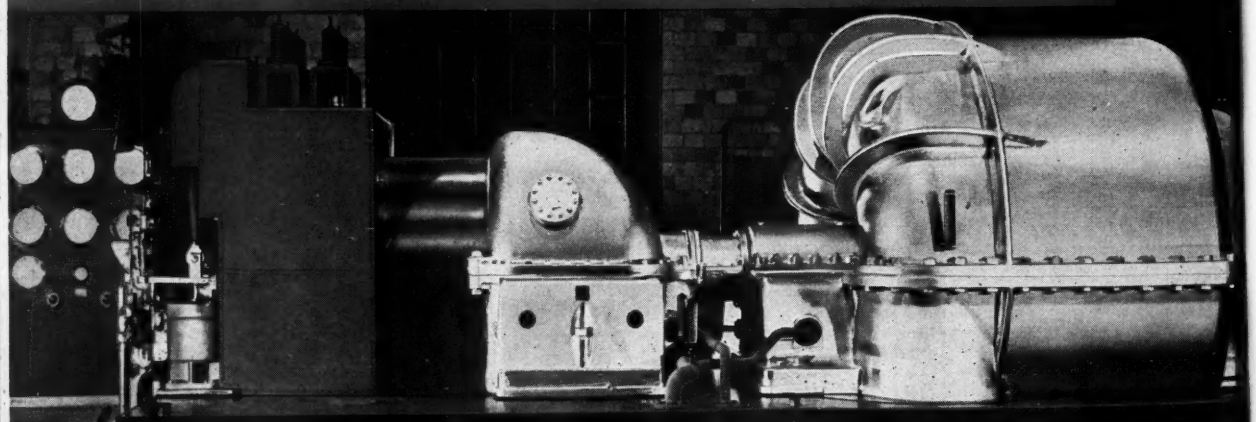
This Allis-Chalmers [illegible],000 cfm axial compressor drives the world's fastest wind tunnel, located at NACA Langley Aeronautical Laboratories, Hampton, Va. The seven stage, 55-ton rotor is so perfectly balanced and friction-free that a man can move it with one finger.



Construction view of 40,000 cfm, 45 psig axial compressor used in petroleum refining. Over 30 of these units, ranging from 16,000 to 60,000 cfm, have been built by Allis-Chalmers over the past 15 years.



Scale model of axial compressor as designed for blast furnace service at 110,000 cfm, 30 psig. The axial compressor is ideally suited for the production of large air volumes at pressures up to 40 lbs. psig.



Allis-Chalmers has wide experience in designing and building air moving equipment for all industries. Shown here is an A-C 75,000 cfm, 30 psig blast furnace blower at a midwestern steel mill. This is of the centrifugal type, driven by A-C 8500 hp steam turbines.

ALLIS-

Job Moving Air

...Quantity No Object!

ALLIS-CHALMERS OFFERS AXIAL COMPRESSORS FOR BLAST FURNACE BLOWING

THE TREND TO HIGH TOP PRESSURE and larger air volumes in blast furnace blowing finds the efficient and field-proven axial compressor ready and able to supply the largest projected blast furnace or combinations of furnaces!

Allis-Chalmers — builders of both axial and centrifugal compressors — is now offering axial compressors for blast furnace service at volumes over 100,000 cfm, and at pressures of 30 psig and higher. With comparable first cost, steam savings on the order of 15 percent are possible because of axial "straight-through" air flow and higher speed operation.

An axial compressor of 110,000 cfm, 30 psig in routine blast furnace service would require 72,100 lb of steam per hr at 600 psig, 825 F, as compared to 85,800 to drive a like centrifugal unit. Installation space and foundation costs are also reduced, since the higher rotative speed makes the axial unit shorter, more compact and lighter.

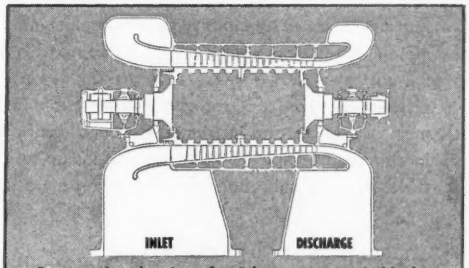
As air volumes increase, the axial compressor rapidly becomes the only practicable method. The air volumes required for even the largest foreseeable blast furnace application present no new design problems for an axial compressor. And wear-resistant alloy, precision cast blades are ideal for contaminated atmospheres.

One Allis-Chalmers axial (see upper left) has operated for four years at an output of 870,000 cfm! A-C axial design and construction have been well proven in the past 15 years with nearly *four million* cfm in capacity already in use or under construction for the petroleum, aircraft, railroad, and gas utility industries.

Blast furnaces can have their progress to more efficient size and pressures *aided* by adopting the more efficient axial compressor. Get the *full* story on how an Allis-Chalmers axial can best solve your need for large air volumes.

There is a qualified steel mill representative near you, ready to explain the axial compressor in detail. Just call the nearest A-C sales office or write for literature to Allis-Chalmers, Milwaukee 1, Wisconsin.

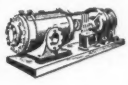
A-3661



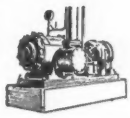
Cross section drawing of axial compressor suitable for high top pressure or other large volume blast furnace blowing. Efficient "straight-through" air flow accomplishes velocity-pressure conversion in an axial direction between alternate rows of rotor and starter blades.

SINGLE STAGE BLOWERS available in pressure ranges from one to 6.50 lb. Rigid, long-lived cast casing can be arranged to any one of 24 discharge positions.

ROTARY COMPRESSORS, sliding vane type. Capacities for 5 to 35 psig. Air is compressed in cells formed by blades moving freely in and out of longitudinal slots in rotor.



DRY VACUUM PUMPS. Range to 28½ inches hg vacuum. Same principle as rotary compressors except that action is reversed—inlet evacuates, exhaust is open.



CHALMERS

A-C ALLIS-CHALMERS

Power, Electrical, Processing Equipment for Iron and Steel

MUELLER BRASS CO. ALLOYS FOR AVIATION'S TOUGHEST APPLICATIONS

"803" • Mueller Brass Co. "803" metal is a high silicon iron-copper bronze that is ideally suited for many difficult applications in jet aircraft. "803" metal has unusually good machinability, and it is extremely ductile. It is non-galling and has excellent mechanical properties at temperatures up to 500°F., factors that account for its wide use as roller bearing cages and other specialty parts in jet engines.

"600" SERIES • "600" series are high strength bearing bronzes that do not contain any hard-to-get tin. They can be forged into relatively complicated shapes that are closer to size and require less machining than sand castings. "600" series metals have a low coefficient of friction and a tensile strength 2½ times that of the cast phosphor bronzes. They are highly resistant to wear and corrosion. These properties make "600" series highly desirable for use as parts on hydraulic equipment, actuators and instruments in jet aircraft. "600" series metals are available in standard or special extruded shapes up to 12' mill lengths. There is a "600" series alloy to suit your special bearing metal needs.

TUF-STUF • Mueller Brass Co. TUF-STUF aluminum bronze alloys have found wide acceptance for jet aircraft parts like the rotor for hydraulic pumps and other vital jet engine parts that must stand up. TUF-STUF alloys are corrosion resistant . . . strong and light and extremely long-wearing. They resist oxidation, even at high temperatures. TUF-STUF alloys are available in the form of forgings, rods and screw machine parts. They fill Federal Specification QQ-B-666, Grade B, and several other variations.

For complete information about "803" metal, the "600" series alloys and TUF-STUF, write today to

82

MUELLER BRASS CO. PORT HURON 19, MICHIGAN

→ **for sturdy reliability**

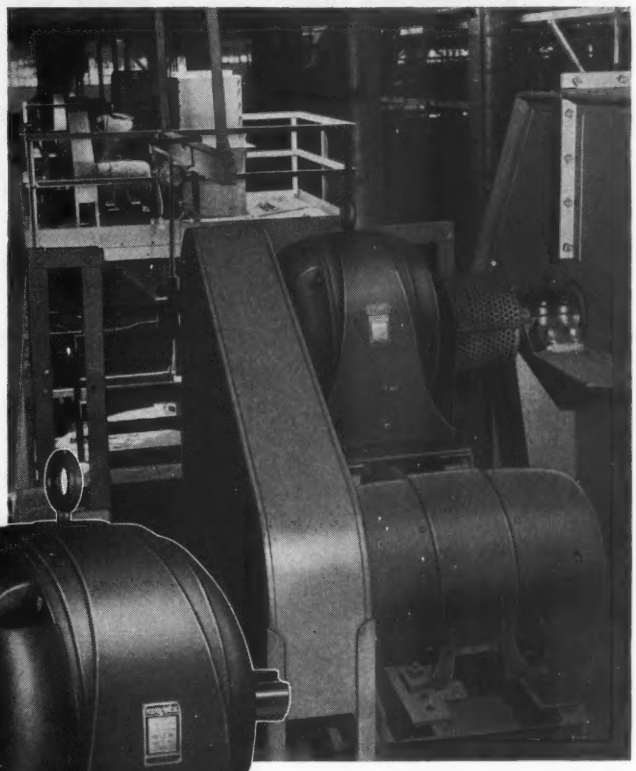
→ **low original cost**

→ **low operating cost**

LINE-O-POWER DRIVES

Here is one of a number of compact Foote Bros. Line-O-Power Drives installed in the Ford Motor Company Dearborn Specialty Foundry Rouge Plant. These drives are transmitting power to the bucket conveyors that raise sand to the hoppers.

Heavy loads, continuous service, dust conditions, all try the stamina of enclosed gear drives in applications such as this. Line-O-Power Drives have proved their ability to stand up, even under such tough conditions, and to assure long, trouble-free service.



One of the many Foote Bros. Line-O-Power Drives installed in The Ford Motor Company Dearborn Specialty Foundry Rouge Plant, Detroit.

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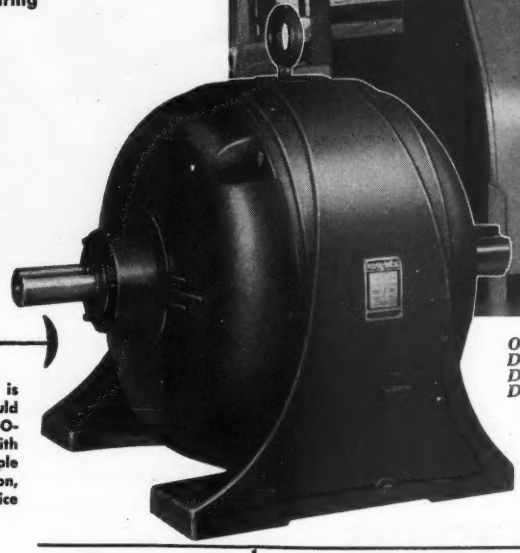
When one direction of rotation is desired and reverse direction would cause damage or danger, Line-O-Power Drives may be equipped with the Foote Formsprag Backstop. Simple in design, rugged in construction, this unit will give years of service with minimum maintenance.



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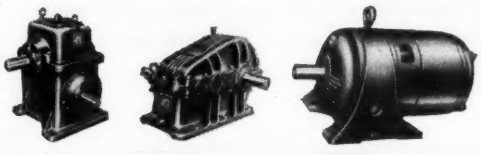

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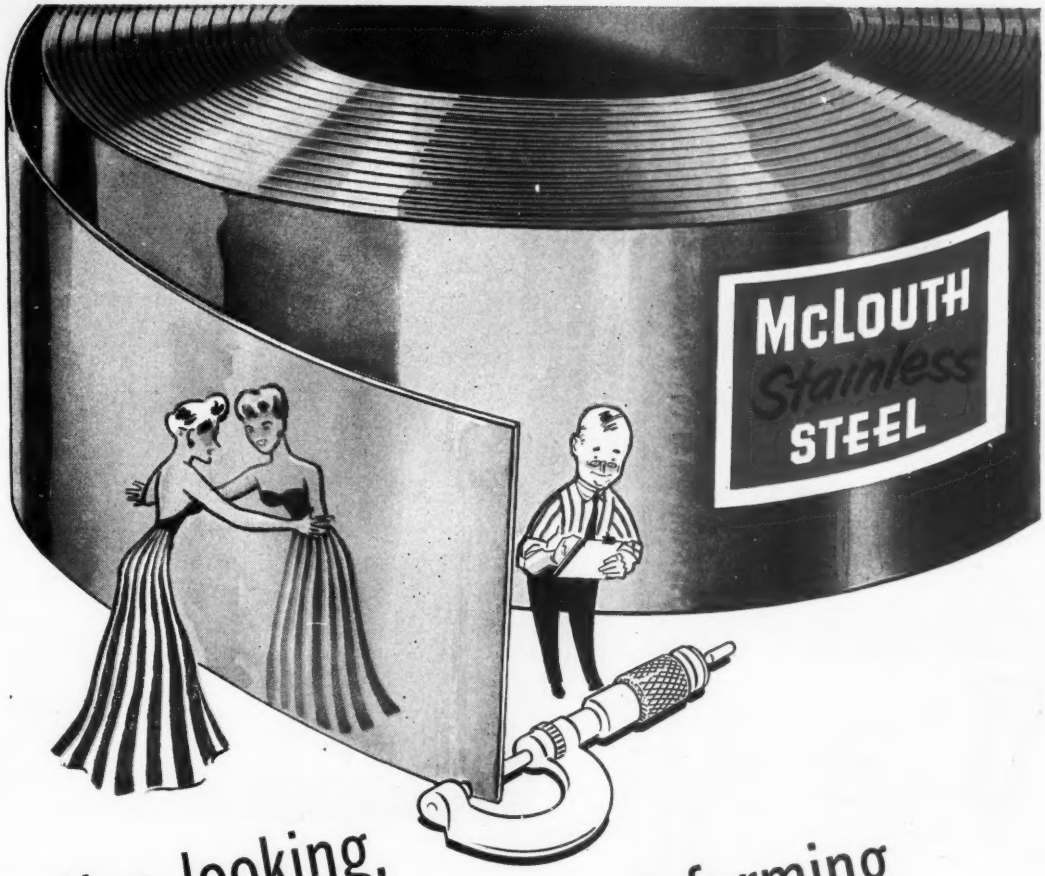

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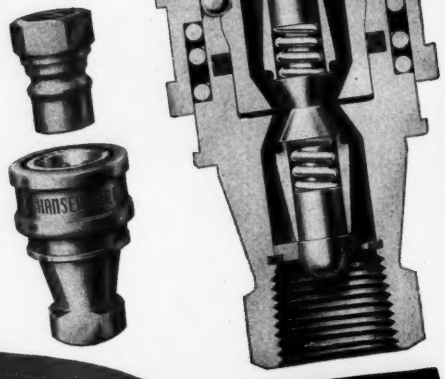

SEALS BOTH ENDS OF LINE

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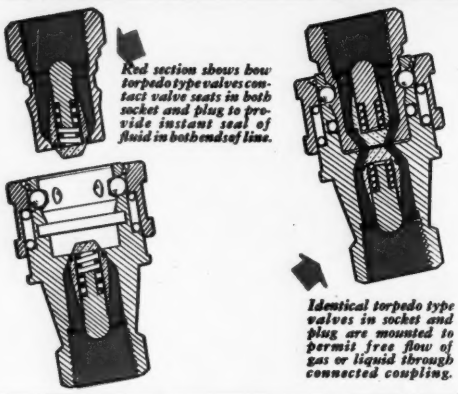

Red section shows how torpedo type valves contact valve seats in both socket and plug to provide instant seal of fluid in both ends of line.

Identical torpedo type valves in socket and plug are mounted to permit free flow of gas or liquid through connected coupling.

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To connect, you merely pull back sleeve and push plug into socket. Identical torpedo type valves in plug and socket are mounted to permit free flow of gas or liquid when coupling is connected.

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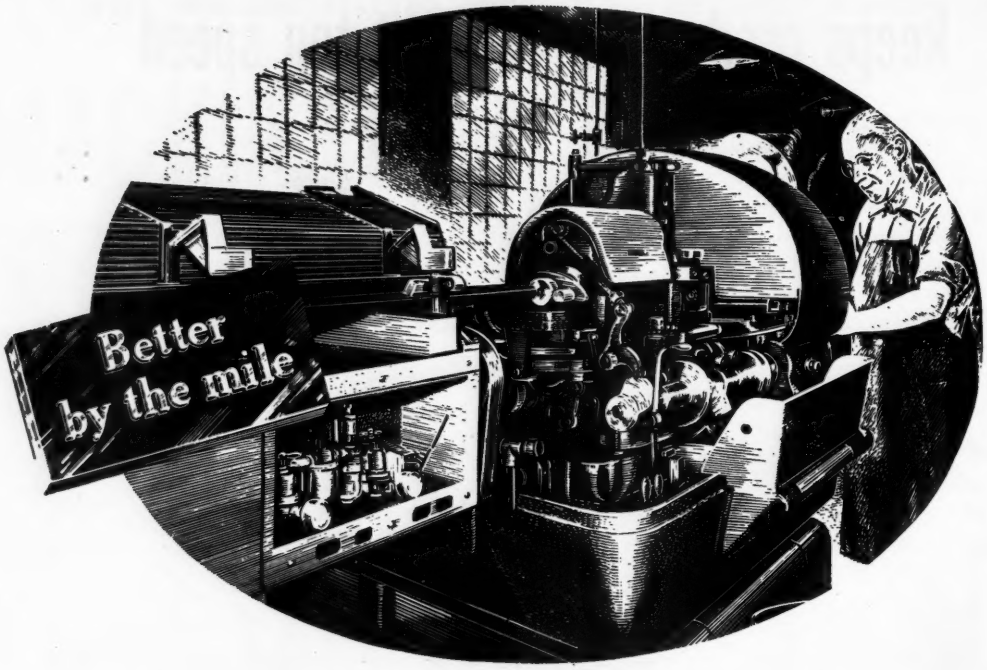

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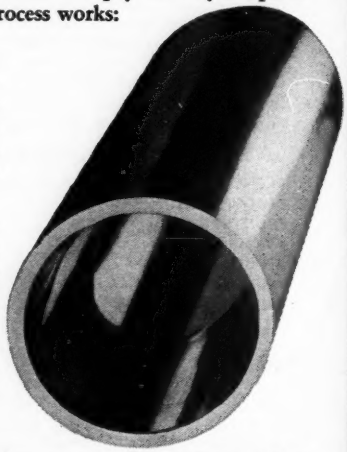
- **In no part of this operation is there any action which can produce longitudinal scratches. The metal is not drawn through a die and over a mandrel.**



SIZES? Rockrite cylinder-finish tubing comes in bores from 1½" to 5½", depending on wall thickness. Get additional facts and figures from Joseph T. Ryerson & Sons Company, Chicago, national warehouse distributor, or write us direct.

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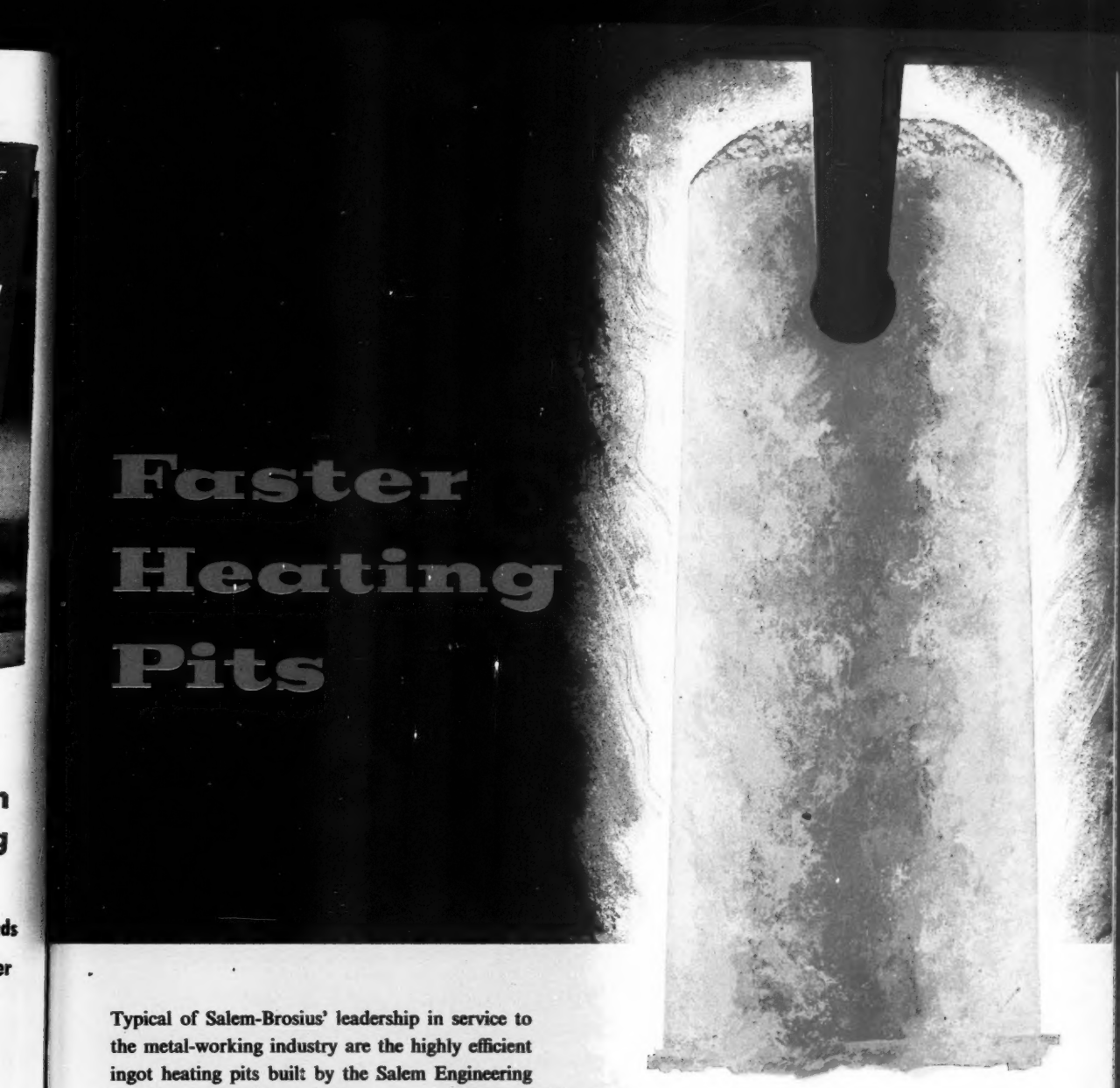

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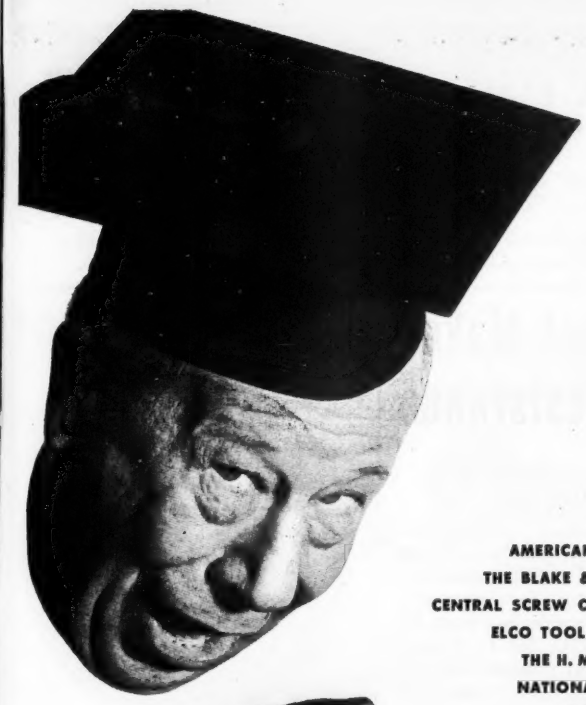

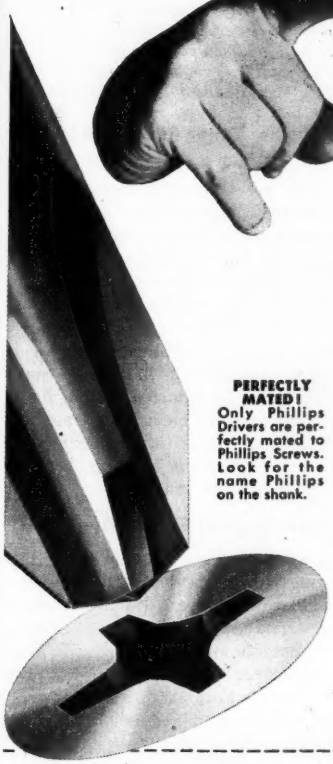

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As Advertised in The Saturday Evening POST

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ELECTROMET Data Sheet

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario.

Why 3 Per Cent Chrome Steel Makes Good Castings for Wear Resistance

Castings of 3 per cent chromium steel have been used in substantial tonnages, for many years, for various equipment parts demanding good wear resistance. Such castings offer an excellent combination of hardness and toughness. Typical applications are crusher parts used in rock- and ore-crushing equipment, swing hammers for pulverizing coal, railroad switch frogs, gears, pulleys, sheaves, and other castings that must meet severe conditions of wear.

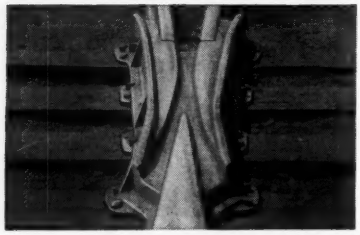

Fig. 1. Railroad switch frogs, which are subject to severe wear, give outstanding service when cast of 3 per cent chromium steel.

The 3 per cent chromium steels, are normally produced in a carbon range of 0.30 to 0.50 per cent. They exhibit excellent depth-hardening properties, which simplify heat-treatment and insure uniformity throughout heavy sections. The analysis is usually modified by a molybdenum addition, since this element aids in increasing hardenability.

Fig. 2. Grating for top of shake-out machine is cast of 3 per cent chromium steel to give good wear resistance and long life.

Properties Improved by Heat-Treatment

The best properties of 3 per cent chromium steels are developed through heat-treatment. Generally, this consists of a normalizing treatment from 1650 deg. F., followed by tempering in a range between 1000 and 1250 deg. F., depending on the physical properties desired. Double normalizing is sometimes used to obtain further improvement in the grain structure. With carbon on the high side of the specification, air-quenched castings show a Brinell hardness number of over 400 in 3-inch sections. This hardness is practically uniform throughout the section. Oil quenching is employed to produce higher hardness and depth of penetration, and even in a 4-inch section, a hardness number of over 500 Brinell is obtained.

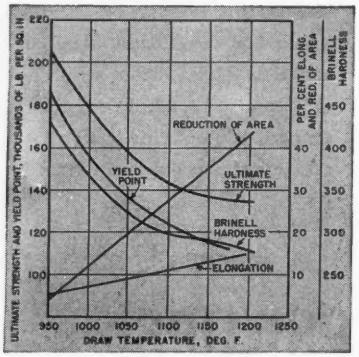

Fig. 3. These curves show the response to tempering of a 0.37 per cent carbon, 2.93 per cent chromium, 0.35 per cent molybdenum steel previously normalized from 1650 deg. F.

The steel also shows good response to tempering. After a normalize and a 1100 deg. F. treatment, it has a tensile strength close to 150,000 pounds per square inch, with an elongation value of about 12 per cent, and a Brinell hardness of about 300. When greater ductility is required, tempering should be done at higher temperatures. However, in such instances, some strength and hardness are sacrificed.

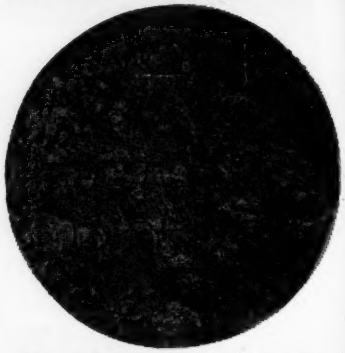

Fig. 4. Photomicrograph of 3 per cent chromium steel normalized from 1650 deg. F. and tempered at 100 deg. F. (X250). The pseudo-martensitic structure is well suited to resist abrasion.

Effect of Other Alloy Additions

Molybdenum in the range from 0.30 to 0.50 per cent will improve depth-hardening characteristics and aid in reducing susceptibility to temper brittleness in the lower temperature ranges. If the molybdenum-bearing steel contains relatively high carbon (0.40 to 0.60 per cent) additions of approximately 0.08 to 0.10 per cent vanadium provide greater uniformity in hardening. Small additions of silicon increase strength and hardness and this element is sometimes increased to 0.80 or 1.00 per cent. Manganese is added in amounts between 0.50 and 0.80 per cent.

Metallurgical Service Available

When you have occasion to produce castings for applications involving severe abrasion and wear, it will pay you to investigate the advantages of using 3 per cent chromium steel. If you need help on some specific metallurgical problem, be sure to consult one of ELECTROMET's specially trained metallurgists and engineers. For further information, write to the nearest ELECTROMET office: in Birmingham, Chicago, Cleveland, Detroit, Los Angeles, New York, Pittsburgh, or San Francisco. In Canada: Welland, Ontario.

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Where Production And Precision Count

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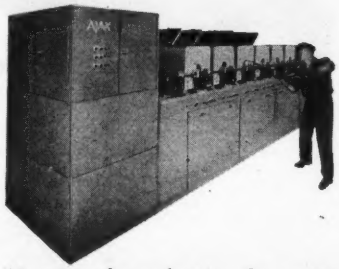

New Ajax-Northrup heater for automotive work has 8 heating stations, 30 interchangeable heating units. Heats billets from one to four inches, rounds or squares, to 2250°F at rate of 7500 to 8500 pounds per hour.

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AXLE SPINDLES

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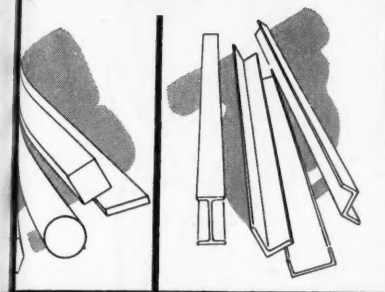

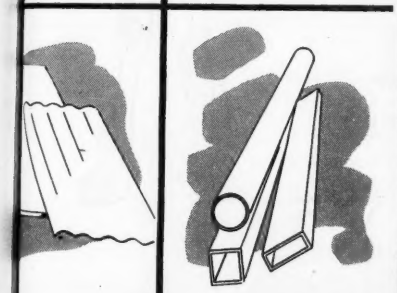

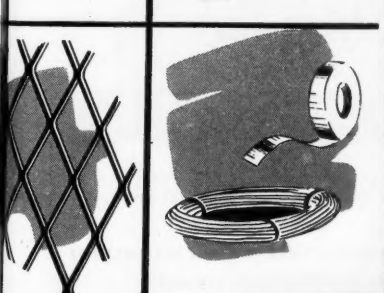

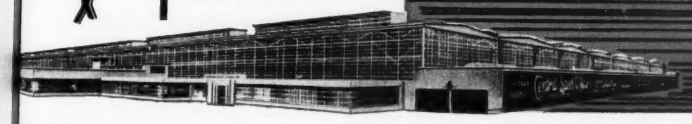

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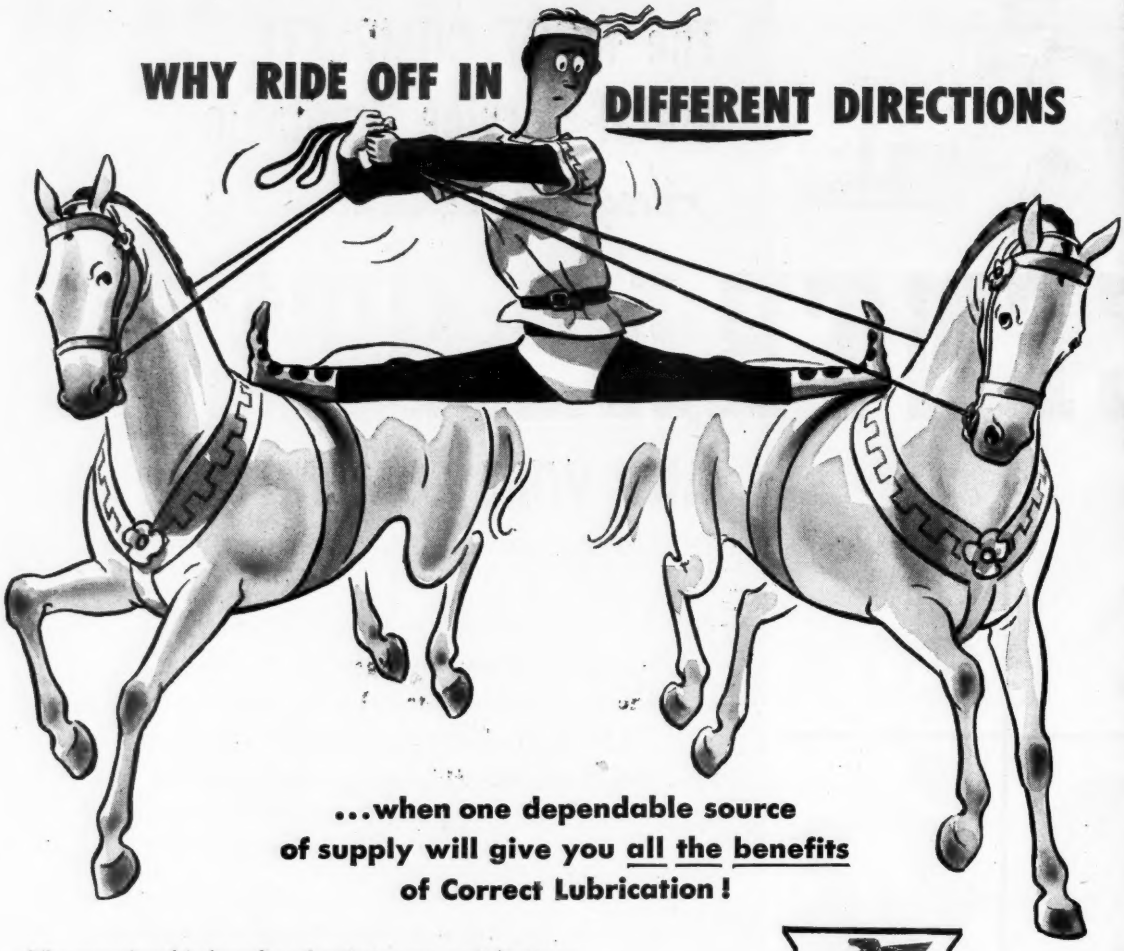

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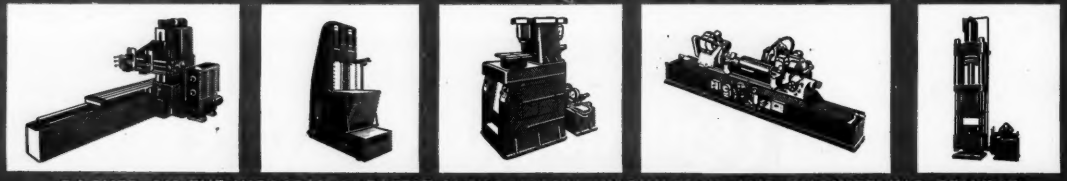

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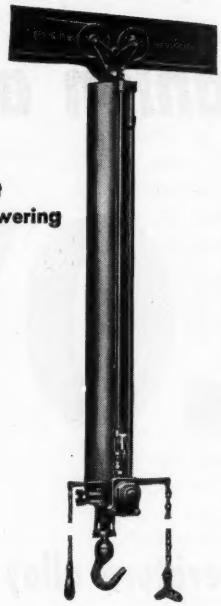

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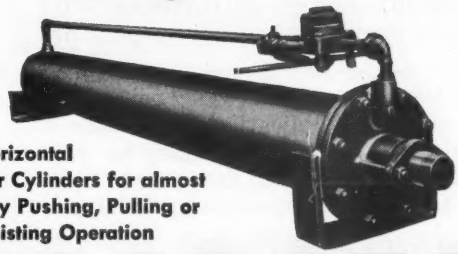

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(32 NICKEL—21 CHROMIUM)

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Incoloy® is not a substitute for Inconel. It's a specially developed companion alloy with a composition of 32 Nickel — 21 Chromium. It provides a useful degree of strength at high temperatures and good resistance to oxidation. And it has good workability and welding properties.

Incoloy is the latest development of INCO's Engineers in their continuous search for better high-temperature materials. Like the other INCO Nickel Alloys it is on extended delivery because of defense demands. So anticipate your needs well in advance — and when ordering, be sure to give NPA ratings and complete end use information.

For more information on this newest high-temperature alloy write for our "Preliminary Report on Incoloy." And if you have a special problem on which you would like the assistance of our High-Temperature Engineers, ask us to send you a High-Temperature Work Sheet.

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May 5, 1952

Balance in Steel?

Production losses in steel resulting from Mr. Murray's fast strike action Apr. 29 occur at just the time when the balance between supply and demand in steel—and other materials—is the closest in 21 months. NPA says the supply of practically all basic materials has shown a "marked easing" since the beginning of March. These were in substantially better supply, as of Apr. 29: Cold-drawn alloy steel bars, heat-resistant alloy castings, structural steel, steel wire of welding quality, tin plate, high grade zinc, vanadium, antimony and lead. The supply of nickel, cobalt and other ferroalloy metals continues "most critical."

Contrast: Oil and Steel

An oil strike will affect the public more quickly than a steel walkout. Although spotty shortages undoubtedly exist in steel, the general inventory position is good—three to four weeks' supplies. Oil stocks are also high, but auto drivers will be hit fairly soon if most of the 90,000 refinery and pipeline workers stay out long. The biggest of the oil unions, Oil Workers International Union-CIO, wants a 26-cent-an-hour increase. One independent outfit in Missouri was on the verge of settling last week for 15 cents but at the last moment voted against the agreement.

Problem of Product Mix

Steel strike or no steel strike, new arguments are being marshaled against steel controls. One of the latest involves the product mix. Wheeling Steel Corp. says its sharp drop in first quarter sales was "largely due to the distortion of the corporation's product mix, resulting from the imposition of government allocations and restrictions which will continue to affect adversely the normal business practices of the corporation."

Paradox in Scrap

We're now exporting substantial tonnages of scrap, despite the fact that only a few months ago the shortage of that material threatened steel production. The turn-about (p. 72) occurred because of this situation: A government directive forced auto wreckers to speed up the scrapping of cars. All the scrap on those vehicles except unstripped motor blocks found ready markets. Foundries are the major users of motor block scrap, but their operations are sluggish now and so motor blocks are a drug on the domestic scrap market. Result: Motor blocks can now be exported.

A Matter of Sales

Sales troubles are here for consumer durables. They may be ahead for capital goods. Besides cutbacks in production of stoves and refrigerators by major manufacturers, output of other appliances is

Production-Engineering News—p. 97 *The Market Outlook—p. 179*

now being curtailed. General Electric Co. will limit production of automatic clothes washers at Trenton, N. J., May 19. It will stop assemblies of electric garbage disposal units at White Plains, N. Y., all this week and then resume on a limited basis.

Headache with Labor Surplus

Watch for action in the next few days to clear up difficulties arising from Defense Manpower Policy #4. That permits placement of contracts in the designated labor surplus areas. A company in such an area, if it's an unsuccessful bidder on a defense contract, has the right to meet the bid of the successful bidder not in a critical area. What happened is this: Some big companies in the surplus areas have matched the bids of smaller firms not in the areas and have thus won the contracts. The powerful House Small Business Committee wants DMP #4 modified or its interpretation liberalized to prevent small companies outside surplus areas from losing contracts.

Small Business: Ratio Off

So much fuss is being raised over DMP #4 because small business' dollar share of prime contracts is definitely dropping. The dollar value of primes awarded by the Army to small business in February fell to 14.3 per cent. Dollar value participation during the first eight months of fiscal 1952 stands at 25.2 per cent, against 29.8 per cent in fiscal 1951.

Nearly Adequate

Unless we get into a full-scale World War III, the government plans no extensive armament plant construction on its own hook. It thinks our capacity is just about adequate. Of the 178 plants in the National Industrial Reserve, 106 have been sold, 54 are under lease or contract and 18 are in custody of General Services Administration. As of Apr. 1, 141 of those 178 facilities were in use for mobilization; 19 were in active use for nondefense products. The 18 not in production include 12 explosives and ammunition loading plants, three shipyards, one magnesium plant, a heavy rolled armor plate plant and a graphite plant expected to be in production soon.

Straws in the Wind

Ford Motor Co. has received an additional order from Army Ordnance for more medium tanks, bringing the total value of its orders for the weapon to more than $300 million . . . John A. Roebling's Sons Co.'s Woven Wire Fabrics Division has sold its insect wire screening manufacturing facilities to Aluminum Co. of America . . . If the copper strikes in Chile last a month, 36,000 tons of copper will be lost to American users.

What Industry Is Doing

They don't make steel in Washington (p. 69) . . . Despite labor disturbances, decontrol plans for steel are still in the works (p. 70) . . . The FTC basing point case is not closed, notwithstanding an apparent settlement last August (p. 71) . . . Machine tool subcontracting may level off (p. 72) . . . Metal powder makers look to improved techniques to boost production (p. 73) . . . Springmakers' backlogs have shrunk so much that some manufacturers are working on current orders (p. 73).

No overheating problems here from prolonged holding time

When this Bath Contour Former stretch-forms aluminum, stainless and carbon steel aircraft parts into some 700 different shapes, a 50-ton hydraulic ram imparts tension to the work.

Necessarily, prolonged holding time is involved. Normally, this would overheat the hydraulic oil, causing lost capacity through pump slippage, as well as risking seizure of close-clearance parts. But, The Cyril Bath Company doesn't run this risk. All models of its stretch formers, from 12½ tons to 150 tons, are equipped with Ross Type BCF Exchangers. Both manufacturer and user are thus assured that hydraulic oil will always remain at a safe and most effective temperature level.

For all types of hydraulically operated machines, all-copper and copper alloy Ross Type BCF Exchangers are being used universally today for assurance of safe operating temperatures. Pre-engineering, complete standardization and mass production just naturally make them the most logical choice. **Details** in new Bulletin 1.1K5. Write.

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These Limit Stops are operated directly by the hook block, hence stretching of the hoisting cables does not affect the tripping point. By removing the fear of an over-hoisting accident, the YOUNGSTOWN Limit Stop enables the crane operator to do better work.

Easily applied to both new and existing A-c and D-c cranes.

YOUNGSTOWN *Safety* LIMIT STOPS for Crane Hoists

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Ask for Bulletin 1032 describing the Youngstown Safety Limit Stop and its many advantages.

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Momentous Decision

Now that the President's seizure of steel properties is likely to wind up in the Supreme Court, it is pertinent to examine the arguments of government lawyers. On Apr. 24, Assistant Attorney General Holmes Baldridge pleaded before Federal District Judge David A. Pine that the President has unlimited power in time of declared emergency and that the courts have no authority to review his executive orders.

Later, in seeking a stay of Judge Pine's injunction before the United States Circuit Court of Appeals, Solicitor General Philip Perlman declared: "After all the noise and excitement of last week, you'd think the President of the United States had done something no other President had done before." He then cited several acts of previous Presidents as precedents for Mr. Truman's action.

Judge Pine previously had rebutted this reasoning effectively when he said: "It is difficult to follow the argument that several prior acts apparently unauthorized by law, but never questioned in the courts, by repetition clothe a later unauthorized act with the cloak of legality. Apparently, according to this theory, several repetitive unchallenged illegal acts sanctify those committed thereafter. I disagree."

This sound reasoning by Judge Pine has timely significance. In many of the cases cited by government lawyers where Presidents exceeded their authority, the danger of pyramiding excessive executive powers was limited. The central government in Washington was relatively weak. Its leaders had no desire to interfere with the ordinary affairs of citizens.

Today the situation is different. The tentacles of a huge, sprawling federal bureaucracy extend into every phase of citizens' lives. Washington is drunk with power. Throughout all of the years of the Republic, the danger of abuse of that unprecedented power never has been greater.

For the Supreme Court to overrule Judge Pine would be disastrous. It would be a signal for every power-crazy bureaucrat in Washington to renew and intensify his encroachment upon the rights of citizens. It would make practically meaningless our proud boast that ours is a government of the people, by the people and for the people. God grant our justices wisdom in this great hour of momentous decision!

E. L. Shaner

EDITOR-IN-CHIEF

LONG VS. SHORT PULL: Throughout the series of events which led up to the present mess in steel, the union chieftains have been playing the short pull against the long pull. Apparently they reason that it is more advantageous to grasp the present opportunity for higher wages and other benefits, regardless of their effect upon the nation's economy, than

to pursue a more patient course, even though patience might work out more profitably in the long run.

Not all union leaders agree with Philip Murray's opportunistic tactics. Already there is fear in some union quarters that the steel union will live to regret that Mr. Truman and Mr. Murray entered into their trick to obtain wage grants by government intervention. They know that deals made by the whim of one man are tricky compared to agreements arrived at through honest collective bargaining. It is probable that Mr. Murray is about to learn a lesson about the merits of long pull and short pull policies.

* * *

THE PENDULUM SWINGS: In addressing the annual spring conference of Iron and Steel Engineers, W. W. Sebald, president of Armco Steel Corp., touched upon a problem that means much in the future development of the metalworking industries. He stressed two aspects of this problem: 1. Efforts of union labor leaders to share managerial rights with management. 2. Trends toward the feeling that the interests of labor and management are opposite rather than mutual.

These two movements are basic in the present crisis in labor relations in the steel industry. They arise largely from unwise leadership on the part of the highest union officials. This unwise leadership stems from political maneuvering during two decades by which union leaders were guaranteed a dictatorship and unions were guaranteed a monopoly by government action. Hope for relief comes chiefly from the reasoning that the pendulum of favoritism, having swung too far to the left, will swing back under the pressure of public indignation.

* * *

MEASURE OF PROGRESS: Everybody in the metalworking industry has some sort of an idea about the manner in which improved materials and methods made available by research constantly result in the design and manufacture of products of higher quality and better performance. While we are conscious of this progress, we are not always able to measure it in definite terms.

Recently Joseph H. Quick, president of Harrington & Richardson Arms Co., cited figures which show specifically performance gains attributable to improved materials. Today this arms manufacturer (p. 144) is turning out revolvers and pistols good for 150,000 rounds. As recently as 15 years ago, arms manufacturers thought they were doing very well if their weapons were good for 25,000 to 40,000 rounds. This is a striking improvement in performance.

* * *

BACK CAMP-REED BILL! Every executive of a company in which inventories are an important factor should make it a point to become familiar with the identical bills introduced in the House by Representatives Sidney A. Camp (Dem., Ga.) and Dan A. Reed (Rep., N. Y.) The purpose of the Camp-Reed measure (p. 80) is to liberalize the provisions of the Internal Revenue Code so that LIFO—the last-in, first-out method of inventory pricing—can be used by a larger number of corporations.

Most companies have been using the FIFO inventory pricing method (first-in, first-out). Inventories of corporations using FIFO have risen in dollar value an estimated $25 billion during the last decade solely because of inflation. Taxes, dividends and other requirements have been paid on this fictitious profit. To the extent that prices recede, inventory write-offs under FIFO will reduce taxable profits in the future.

LIFO, which provides for more accurate profit reporting, has been recognized by the Bureau of Internal Revenue, but with such reluctance that many corporate taxpayers hesitate to employ it. The Camp-Reed proposals would promote freer use of LIFO.

* * *

SLOWLY FADING AWAY: We have a hunch that throughout steeldom there is a nostalgic feeling of regret due to the fact that bessemer grades of steel are fading. Bethlehem Steel Co. at Johnstown, Pa., and Jones & Laughlin Steel Corp. at Pittsburgh are abandoning converters that have been operating over a long period. These abandonments are not the first; they simply accentuate a trend that has been underway for some time.

This does not mean that the demand for bessemer steel is shrinking. Manufacturers still have a high regard for the superior machinability of the converter product. However, economic conditions currently seem to militate against the converters. The demand for bessemer grades seems to be satisfied by the resulphurization of open-hearth or electric furnace steels.

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When you were a boy, your ambition was to have one of those jack-knives with over a half-a-dozen blades that would do everything. Right now, wouldn't you like to have such an all-purpose machine in your shop?

Here it is! The Kling Combination Shear, Punch and Coper that handles all the different operations shown above and many more. One of these Kling Machines in your shop can turn out the work of a separate punch, angle shear, bar shear, plate shear or notcher — and yet it costs only a few dollars more than a single-purpose punch.

For increased speed and safety, each end operates independently. Foot pedals allow both operators to keep hands free to hold work.

On all kinds of metal-fabricating jobs this Kling Combination will speed up your production, save man-hours and make money for you. Available in 3 sizes for light, medium or heavy work; all ruggedly built, and all meeting machine tool precision standards.

SEND FOR FREE BULLETIN that gives you complete details of all the jobs this machine can do; full technical data and specifications. Ask for Bulletin 347. Kling Bros. Engineering Works. 1324 North Kostner Avenue, Chicago 51, Illinois.

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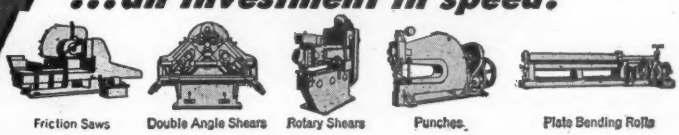
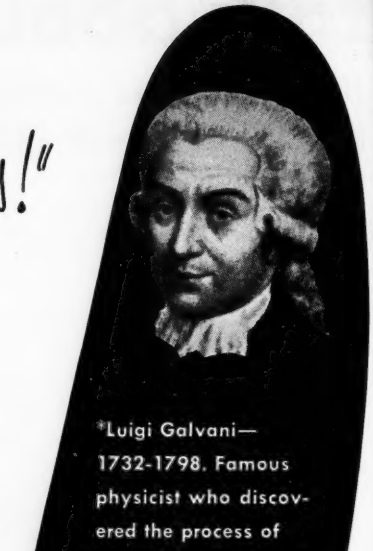


Friction Saws | Double Angle Shears | Rotary Shears | Punches | Plate Bending Rolls

"Old Luigi Galvani* would certainly get a shock out of this!"



*Luigi Galvani—1732-1798. Famous physicist who discovered the process of generating electricity chemically. Father of Galvanizing process.

Inland's new continuous galvanizing line . . . the longest in the U. S. A.

Fed into this new galvanizing line, cold-rolled strip is flame-cleaned, annealed and galvanized. It emerges a full city block away, cut to length or coiled.

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This new galvanizing line is another of the improved steel-making facilities that help Inland to produce better quality steels in record-breaking quantities.

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What Next in Steel Debacle?

Constitutional questions put in second place the original issues in the steel case which are as unresolved as ever. Sawyer promises "no abrupt action"

THEY make no steel in Washington. But Washington last week was preventing steel being made in 92 per cent of the country's mills.

The basic issues in the 5½-month-old steel wage case took second place in the public's interest to the constitutional issues superimposed on the case by the President's seizure of the mills.

Agreement on the basic issues, which should have been easy had not the government made itself a party to the dispute, appears to be as far away as ever. And this is in spite of three substantial wage offers made by the industry.

Bitterness Grows — Months of wrangling have intensified the bitterness of feeling and have established all parties in positions from which they are unwilling to retreat. Last December, industrial relations experts believe, the union would have settled for a reasonable wage increase and one that would have been granted by the companies had they been permitted to make the adjustments without hindrance by stabilization rules.

Seizure Enjoined, but Stays—Developments on the constitutional issues moved rapidly last week. On Tuesday, United States District Judge David A. Pine ruled the President's seizure was an illegal act and granted a preliminary injunction nullifying the seizure.

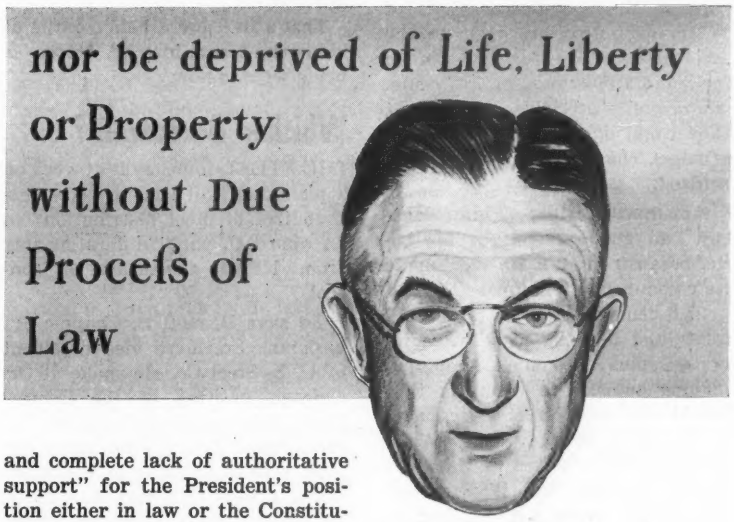
As soon as Judge Pine's decision was announced and before the injunction was issued, the steelworkers struck. Technically, they struck against the government.

On Wednesday, government attorneys were granted a stay of the injunction by the Court of Appeals in a 5 to 4 decision.

The circuit court denied an industry plea for a ban on a government order wage increase. Secretary of Commerce Charles Sawyer promised "no abrupt action."

The case then moved toward the Supreme Court for an ultimate decision on the constitutionality of the seizure of the steel industry.

"No Inherent Power" — Judge Pine denied the President has any inherent power to seize the steel mills. He held there is an "utter and complete lack of authoritative support" for the President's position either in law or the Constitution.



JUDGE DAVID A. PINE

Judge Pine questioned the necessity for the President's action. There is no proof that the Taft-Hartley Act would not be effective if tried, or if it failed, that Congress would fail to protect the nation.

Further, the judge said: "I believe the contemplated strike, if it came, with all its awful results, would be less injurious to the public than the injury that would flow from a timorous judicial recognition that there is some basis for this claim to unlimited and unrestrained executive power, which would be implicit in failure to grant the injunction. Such recognition would undermine public confidence in the very edifice of government."

Turning Point? — Two bright rays of hope were seen in last week's developments: 1. That Judge Pine's decision and possibly the Supreme Court decision to come would halt the executive usurpation of power and restore constitutional government; 2. that the whole steel wage muddle might cause public revulsion for the labor-government alliance of the past two decades.

Strike Effects — Industry men believe the effects of a steel strike on defense production are being overemphasized by government spokesmen for political purposes. Stocks of steel in defense plants are substantial.

Civilian goods producers generally have stocks to support operations for three to five weeks.

Warehouse shipments to civilian consumers and to foreign countries were embargoed immediately.

How Things Got This Way

APPROXIMATELY 5½ months of the most momentous industrial and labor history on record was written just prior to the steelworkers' walkouts on the evening of Apr. 29.

The steel case has its roots in events far back in the Roosevelt administration when the pendulum of public opinion swung far over in favor of labor. Believing that climate of opinion still prevailed, United Steelworkers of America-CIO last November 15-16 formulated 22 demands to be made on the steel industry.

To the WSB—Negotiations made no progress and on Dec. 22, the

case was referred to the Wage Stabilization Board. A strike scheduled to start at 12:01 Jan. 1 was postponed until Feb. 23 while a special WSB panel deliberated. Hearings began Jan. 10 and continued, with some interruptions, until Feb. 16. On Feb. 22 the steelworkers postponed a strike until Mar. 23. The panel reported to WSB on Mar. 13, but final recommendations could not be made by the strike deadline, so the union again postponed a walkout, this time until Apr. 8.

In mid-March, the steel industry, through the industry members of WSB, made two proposals to the steelworkers, one for 9 cents an hour and a later one for 13.7 cents. Because the steelworkers thought they could do better through government channels, the offers were refused.

Apparently Right—Philip Murray had good reason for his belief because on Mar. 20, WSB made its recommendations for settlement —24.6 cents an hour in direct pay hikes and benefits as a wage increase, plus the union shop and oblique support to demands that would encroach on steel management's freedom to manage. While even the union stated at the start of the hearings that WSB recommendations were not binding, it took the position that they were when it discovered the generosity of the terms and demanded that the steel industry accept the WSB "decision."

The steel industry refused, but on Apr. 3 made still another offer to the steelworkers—17.5 cents an hour. That was again turned down. The stalemate continued until Apr. 8, just before another strike deadline. That evening President Truman seized most of the steel industry, presenting a version of the facts that was refuted Apr. 9 in a national radio and television speech by Inland Steel Co. President Clarence B. Randall. On that same day, U. S. District Judge Alexander Holtzoff refused to grant a preliminary court order restraining the seizure. A precarious status quo continued from then until Apr. 29. By that time the government, as the nominal employer was about to grant a wage increase to the steelworkers. U. S. District Judge David A. Pine's decision of Apr. 29 that the seizure was unconstitutional stopped that, and on Apr. 30 the steel industry was restored to its private owners. Fighting mad, Philip Murray called his union members off their jobs on the evening of Apr. 29. On the evening of Apr. 30, the Court of Appeals granted a stay-of-execution on Judge Pine's injunction which in effect left the government in control of the steel industry. So, at that moment, Mr. Murray's fast strike action left the union in the position of striking against the government.

That's five and a half months of industrial-labor history. More is being written now.

Whither Decontrols?

THE STEEL industry is at work on a plan that will lead to "complete decontrol of steel distribution" in an approach that "differs sharply from NPA's relaxation of controls."

So says Bennett S. Chapple Jr., assistant executive vice president of U. S. Steel Co. He spoke at the Chicago meeting of the Central Steel Fabricators Association before Judge David Pine ruled the steel seizure illegal and the steelworkers went on strike Apr. 29. A strike will delay decontrol plans, but they will only be tabled, not discarded.

Outline—He says the industry's plan will provide decontrol with a minimum of dislocation. The proposal, which will be submitted to the Office of Defense Mobilization, probably will recommend that first the ticket system be progressively abandoned, freeing consumers to use the available supply of steel as they wish. Then, control over the quantities of each steel product which can be turned out should be abandoned. The priority of direct military and atomic energy requirements would be carefully safeguarded.

"This plan," explains Mr. Chapple, "differs sharply from NPA's. We are going to strive for complete abandonment of the present control mechanism, not just for loosening it a little." He reveals that six months ago the steel industry submitted to Charles Wilson, then defense mobilizer, a report outlining preliminary decontrol steps. Several of those recommendations already have been adopted, he says.

Adequate — Mr. Chapple estimates that more than 9 per cent of the steel shipped in the last 14 months has gone into inventories. He points out that steel users now have good inventories generally, although there are soft spots and a prolonged strike would give them serious troubles. The tonnage of steel in inventory and in process just before the Truman seizure, he says, "had reached the highest point in history."

Mr. Chapple foresees a time coming soon when steel production may have to be checked, unless present steel controls are lifted and restrictions on consumer durable goods output eased.

Record Set by Blast Furnaces

New record for blast furnace production was set in March.

Figures just released for that month by the American Iron & Steel Institute show blast furnace output was 6,300,006 net tons. This is comprised of 6,241,286 tons of pig iron and 58,720 tons of ferromanganese and spiegel.

Previous monthly record for blast furnace production was set last October, when production totaled 6,197,176 net tons. That figure consisted of 6,132,051 tons of pig iron and 65,125 tons of ferromanganese and spiegel.

To attain the new record in March, the nation's blast furnaces operated at 100.8 per cent of capacity. This is the highest rate operated since the Korean war began. Also contributing to the new record is the country's increased blast furnace capacity. Annual capacity is now 73,782,340 net tons. Last year it was 72,471,780 tons.

Blast furnace output through the first quarter of 1952 totals 18,124,199 tons. This exceeds the first quarter of 1951 when there was a record output of 17,077,785 tons.

Further comparisons follow:

	Pig Iron	Ferromanganese and Spiegel	Total Blast Furnace Output
1952	(net tons)	(net tons)	(net tons)
February	5,722,673	61,929	5,784,602
March	6,241,286	58,720	6,300,006
1st Qtr.	17,943,186	181,013	18,124,199
1951			
February	5,117,603	58,731	5,176,334
March	5,946,312	69,350	6,015,662
1st Qtr.	16,884,395	193,390	17,077,785

Who Shall Manage?

Armco head tells iron and steel engineers that labor demands a share in management

MANAGEMENT leadership is at stake in the attempts of labor leaders to develop more cleavage between management and men, says W. W. Sebald, Armco Steel Corp. president.

"Labor leaders are making promise after promise to influence men and are demanding the right to share in management." (For more on this problem, see STEEL, Apr. 14, p. 65.)

Costly—Addressing the annual spring conference of the Association of Iron and Steel Engineers in Cincinnati, Mr. Sebald pointed out that the feeling the interests of labor and management are opposite rather than mutual has been costly to the country.

The nation's standard of living, he says, "would shoot upward more rapidly than ever before if many of our national labor union leaders would co-operate and work constructively in the interest of producing more instead of the philosophy of more pay for less work. We simply cannot have two or three parties in the driver's seat and ever arrive at the destination we hope to reach. We are bound to wreck the car."

Technical — The 1000 engineers and operating men also heard 18 technical papers covering rolling, mechanical, combustion and electrical problems common to the industry; inspected the Armco's Middletown, O., works where a new open hearth shop with automatic charging system, continuous galvanizing line, blast furnace and coke oven construction project are under way.

Next year's spring conference will be held at Buffalo, first there since 1948. The Association's annual fall meeting and Iron and Steel Exposition will be held in Cleveland the first week of October this year.

Building Trades Wages Rise

Union hourly wage scales of building trades workers rose 0.6 per cent during the first quarter of 1952 as compared to a rise of 0.9 per cent during the previous quarter. The Labor Department survey was based on seven major building trades in 85 cities.

As of Apr. 1, the average ununionized building trade worker made $2.47 an hour, 18 cents above the July 3, 1950, level. Of the seven trades included in the computation, the highest average wage was $3.08 for bricklayers.

FTC Has Ace up Sleeve

Steel basing point case isn't dead issue. FTC could play trump again

THE FEDERAL TRADE Commission for the time being will let well enough alone in the matter of freight absorption of steel. The catch is that most steel buyers and sellers thought that the issue was completely settled, not just pending.

The settlement that was supposed to have been made last August in the steel multiple-basing-point case may not be final. FTC has not yet accepted the compliance reports which were filed by the defendants within 60 days after the date of agreement. The commision says it has not accepted them because it's "not sure" of the extent to which freight absorption and the quoting of delivered prices is permissible.

Future Import — The matter is not vital now, but it will become so in the period ahead when a buyers' market again develops. Now steel producers continue the method adopted by them in 1948; they quote f.o.b. mill prices on most products and charge the customer with the full transportation to destination. But when at some future time business falls off to the extent of forcing competitive concessions, the custom of quoting f.o.b. will have to be modified, market authorities believe.

Steel companies generally believe that they have the right, under the August agreement, to absorb freight in order to meet competitors' delivered prices. The United States Steel Corp. in its 1951 annual report (p. 12) interprets the FTC order as in no way serving "to prohibit or interfere with delivered pricing or freight absorption as such when innocently and independently pursued, regularly or otherwise. The provisions of the order are considered important to the position consistently taken by U. S. Steel, namely, that it has the right to compete in good faith in any market for a share in the business of any consumer."

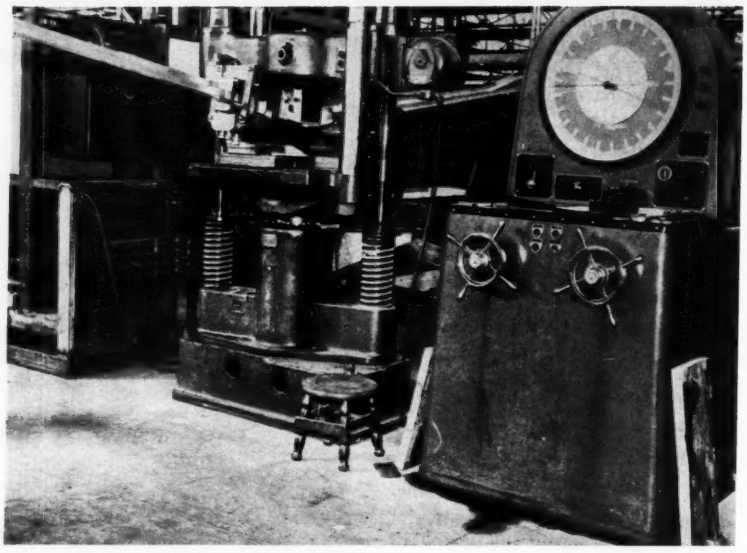
Framed Again

One of the largest makers of steel cabinets, the Berger Mfg. Division of Republic Steel Corp., turns out about 600,000 steel lockers a year at its Canton, O., plant. At present most of Berger's output goes to the Atomic Energy Commission or other defense projects

The Same in Cement—The commission's reluctance to acknowledge that producers have the right to absorb freight in order to meet competitive delivered prices also is reflected in its failure to accept the compliance reports in the Cement case which was terminated by the Supreme Court decision of October, 1947.

From comments by commission spokesmen, there is no intention to interfere with the right to absorb freight and quote delivered prices; the commission, rather, merely wants to hold its hand and wait to see what happens.

If there is any semblance of a return to the old multiple-basing-point-delivered-price system, commission action would be likely. In the meantime, the question of freight absorption in quoting competitive delivered prices remains for final clarification.



New Kind of Sparring Partner

A heavy extruded 75S aluminum spar for Navy fighter aircraft undergoes an elevated temperature, flexture test on a 120,000-pound-capacity Baldwin testing machine in the laboratory at Ryan Aeronautical Co., San Diego, Calif. Bending loads are measured on the Tate-Emery weighing system with dial indicator at the right

Caution Keys Tool Subcontracting

Subs are helping machine tool builders ship at a steadily increasing rate but talk about expanding tool subcontracting now is tempered as tool builders meet in Chicago

HIGH-WATER MARK in the flood of machine tool subcontracting may have already been reached. A heavy rain of firm orders or a workable long-range government buying plan could raise the level of subcontracting, but tool builders are currently being cautious in extending new subcontracts.

These were topics of corridor conversation at the National Machine Tool Builders' Association spring meeting in Chicago last week.

Machine tool builders are concerned lest they bankrupt themselves by stocking extra-expensive sub-made machine tools in the face of stretched-out military demand, rigidly-controlled civilian demand and government-subsidized foreign competition.

Two-Way Stretch—B. A. Gustafson, manager, machine tool division, Sundstrand Machine Tool Co., Rockford, Ill., puts it this way: "Now that defense production is being stretched out, there arises a question whether subcontracting can't be stretched out, too."

Besides the slackened military program, expansion of capacity by the machine tool builders themselves and deliveries by subs of actual machines or parts on orders placed months back are also tempering plans for any increases in subcontracting. Presently about 20 to 25 per cent of production is accounted for by subcontracting. Most machine tool builders have farmed out both parts and complete machine contracts. Controlling factor here, as in most other phases of the machine tool subcontracting picture, is the size of the machine being considered. Larger, more complex, machines, as a rule, are not farmed out for complete construction and they are in most short supply. Medium and small machines have been made outside, and makers of some of this equipment say they are caught up on orders to where they may reduce work forces.

Nub of the Matter—Subcontracting is only one phase of what F. S. Blackall Jr., president, National Machine Tool Builders' Association, describes as the industry's biggest problem. He says, "The paramount problem of the machine tool builder is the manner in which his business cycle swings from glut to gloom, from boom to bust." Machine tool builders are keeping a sharp eye on the water level of firm orders as they decide whether to let more work to subcontractors.

Scrap Exports Upped

Surplus of unstripped motor blocks brought out in government drive will go abroad

PART of the scrap brought out by the government's drive to get auto wrecking yards to wreck out their old cars is now to be exported.

Many old autos were dismantled and scrapped during the campaign, and out of it came a heavy tonnage of cast iron motor blocks. Normally these blocks would be used largely by foundries, but the flood of blocks came at about the time the foundry business declined from government-ordered production cutbacks in the automobile and appliance fields. Consequently, unstripped motor blocks have been a drug on the market.

Boosted—After setting a second-quarter quota (see p. 79) of 10,500 tons of unstripped motor blocks for export to the United Kingdom, the Office of International Trade, U. S. Department of Commerce, authorized shipment of 6000 tons of blocks to other destinations, particularly Mexico. Already, permits have been granted for movement of 3500 tons of blocks to Mexico.

The National Production Authority issued a directive stating there is a surplus of unstripped motor blocks in the states of Washington, Oregon, Montana and Idaho which may be exported. So the total of blocks that can be exported from the United States in the second quarter will exceed 16,500 tons.

In Demand—Applications for licenses to export blocks, as well as other iron and steel scrap, are substantially larger than the tonnages that will be available.

In addition to the 16,500 tons of blocks, there's a second-quarter export quota of 36,000 net tons of other scrap.

Metal Powders Applications Expand

Extension of "hot pressing" technique to include a larger variety of sizes and shapes should give the industry a lift. Radio, television powder uses unique, important

THE ALERT metal powder industry is likely to get a lift before too long through "hot pressing" — simultaneous application of pressure and heat to metal powders to form finished metal products.

New Applications—Speaking before the Metal Powder Association in Chicago, Jerome F. Kuzmick, president of Welded Carbide Tool Co., Clifton, N. J., said improvements in technique now make it practical to apply this method (used for some time in making large tungsten carbide sections) to such tungsten carbide pieces as drawing dies, bushings, ring and plug gages and diamond drilling bits. Substantial savings result in both materials and machining; and drawing dies can be re-pressed for further use.

Resistance-type hot presses are used in producing sections up to 24 inches in diameter. Small sections can be brought from room temperature up to 2600° F in less than one minute. Mr. Kuzmick cannot yet visualize a ten-cent hot-pressed gear, but sees ahead an array of hot-pressed parts complementing those continuously being developed by cold pressing and sintering. His firm has already produced hot-pressed alloys which show the same high temperature stress-rupture values as forgings.

Unique Applications — Magnetic core characteristics of iron powder in radio and television applications constitute an important part of the metal powder industry. Hydrogen-reduced iron powder makes possible electronic cores without special insulation, says R. H. Rodrian of D. K. Williams & Co., East St. Louis, Ill., since the metallic powders are coated during the finishing step with a thin film of oxide which serves as insulation and decreases eddy-current losses.

Electrolytic iron powders have found a variety of applications in cores used at low or medium frequency, including television deflection yokes, transformer parts and various cores used in radios, says William M. Shafer, Plastic Metal Division, National Radiator Co., Johnstown, Pa.

Capt. John D. Dale of Frankford Arsenal, Philadelphia, said it has been proved that 50-cal. cartridge cases can be drawn from sintered iron slugs on the same equipment as steel cases now in production, with no annealing necessary between the three drawing operations.

Officers—New president of the Metal Powder Association is Ernest Klein, manager, metal sales, New Jersey Zinc Sales Co., New York. He succeeds T. L. Robinson, president, Wel-Met Co., Kent, O., now association board chairman. New vice president is Thomas Moore, sales manager, Antara Chemicals Division, General Dyestuff Corp., New York. George Robert, Vanadium Alloys Steel Co., Latrobe, Pa., is new board member.

Plane Fact: Profits Drop

Aircraft and parts manufacturers' profits averaged only 2.2 per cent of sales after taxes in 1951. This is less than half the previous year's figure and substantially lower than the national level of 6.2 per cent for all manufacturers.

Net earnings dropped 32 per cent based on 29 representative companies. An average return of 14.4 per cent on net assets during 1951 was reported for all U. S. manufacturing industries while aircraft and parts averaged only 8.9 per cent.

The decline in aircraft profits last year occurred despite stepped-up plane production for defense, reports the Aircraft Industries Association.

Competition Puts Tension on Spring Makers

SPRING MAKERS' backlogs, extended to three months in the fall of 1951, have snapped back within the last six months; so much so that some firms are working on current orders.

Competition has been getting keener since the first of the year; there are examples of price cutting below cost to get what business is available. That's particularly true for small to medium sized manufacturers who are after the automotive trade. Established firms, who have handled automotive contracts for many years, find themselves obliged to cut the price on some items, in the face of rising costs, just to hold onto business.

Slow on Defense—The level of defense ordering has been disappointing to spring makers, too. They're doing from 10 to 25 per cent in direct military work. Reordering has been slow, and, until the last four to six weeks, new bids have not been in evidence.

Also, many spring manufacturers expanded facilities for expected defense and defense-related work. So that, while they're doing about 125 per cent of pre-war output, they're only operating at about 75 per cent of present capacity. Harder hit are the smaller shops, working single shifts, four days a week, in some cases.

Pricing Relief—Bright spot for precision mechanical spring manufacturers has been the new tailored pricing regulation, CPR 119. This allows for a "formula plan" of setting base period prices—you don't have to name one specific price, you give a price range. An exemption from price control is also permitted for "small orders," as defined by OPS. Approximately 70 per cent of the orders received by these manufacturers are small orders. CPR 119 doesn't apply to the makers of the heavier, hot-wound, spring products, though.

Spring makers aren't having half as much trouble getting alloys, nickel-chrome stainless steel, copper and brass and phosphor bronze, as they did all last year. This helps too, but alloyed springs still make up a small percentage of industry's output.

Within the last month, more military procurement bids have been circulating, and that, coupled with a slight recovery in the auto and appliance business, should take some of the tension out of the spring making industry.

Rocker Arms, Crankshafts, Prop Shafts

Hudson Motor Car Co., under a subcontract from the Wright Aeronautical Corp., is now producing rocker arms for the Wright R-3350 reciprocating engine. J. W. Eskridge, left, vice president in charge of manufacturing, turns over the first finished unit to Maj. Richard E. Oswald, Air Force officer in charge. Crankshafts and propellor shafts will follow rocker arms in production at Hudson

Forecast: Fair Weather for Aircraft Subcontractors

SUBCONTRACTORS are finding it easier to land more aircraft jobs. And favorable aircraft weather for small firms lies ahead, as the defense program soars toward its peak. Latest indicators of the trend towards more subcontracting in aircraft manufacture, are these reports from subcontractors.

L. A. Young Spring & Wire Co., San Leandro, Calif., announces that it's retooling for production on a $5 million order from Douglas Aircraft Co. for assembly of fuselages. Full production will be reached in late 1952.

General Fireproofing Co., working on $35 million of military orders, says it's turning out assemblies for the Republic F-84 jet, flaps for the B-47 Boeing jet and ejection-type seats for various other planes under subcontracts. G. F's regular business includes metal desks and filing cases and aluminum chairs.

With the increased use of jet planes, new appliances are being developed and tested to meet jet requirements. Ryan Aeronautical Co., for instance, announces it has received an order from the Air Force to develop and test an exhaust gas converter. Known as a "De-Corroder," the Ryan device is designed to remove from the exhaust the chemicals which attack aircraft structural materials. The new contract will provide for further development of the device for jet and internal combustion engines.

If lack of sufficient defense subcontracts is one of your metalworking problems, look over the list at the bottom of the page. It's a selection of the latest contracts awarded by the government to metalworking companies. Each contract is valued over $250,000.

Product	Contractor
Lathe Equipment	Reliance Machine & Tool Div., Guide Instrument & Machine Inc., New York
Parts for Machine Guns, 50 cal.	Colt's Mfg. Co., Hartford, Conn.
Turret Controls for 90 MM gun	Vickers Inc., Detroit
Cartridges, 30 cal.	Olin Industries Inc., E. Alton, Ill.
Cartridge Cases, 20 MM	Stoner Mfg. Corp., Aurora, Ill.
Cartridge Cases, M31	Harrison Radiator Div., General Motors Corp., Detroit Chase Brass & Copper Co., Waterbury, Conn.
Metal Parts for Primers	G. M. Co. Mfg. Inc., Long Island City, N. Y.
Range Finders	Eastman Kodak Co., Rochester, N. Y.
Fuzes	Philco Corp., Philadelphia Bayshore Industries Inc., Elkton, Md.
MPTS for Boosters	John R. Wald Co. Inc., Huntingdon, Pa.
Periscope Facilities	Minneapolis-Honeywell Regulator Co., Brown Instrument Div., Minneapolis
Trucks, forklift	Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.
Trucks, Pickup	General Motors Corp., Detroit
Motor Vehicle Parts	Firestone Steel Products Co., Akron Ward LaFrance Truck Corp., Elmira, N. Y.
Aircraft Engines	United Aircraft Corp., Pratt & Whitney Aircraft Div., E. Hartford, Conn.
Aircraft Parts (5 Contracts)	United Aircraft Corp., Pratt & Whitney Aircraft Div., E. Hartford, Conn.
Fuel Controls	Holley Carburetor Co., Detroit
Hydraulic Test Stands	Greer Hydraulics Inc., Brooklyn, N. Y.
Teletypewriters	Teletype Corp., Chicago
Transmitter Units	Dictograph Products Inc., New York
Switchboards	North Electric Mfg. Co., Galion, O.
Generators	Westinghouse Electric Co., Pittsburgh
Diesel Generator Sets	Caterpillar Tractor Co., Peoria, Ill.

DPA Issues 177 Certificates

The Defense Production Administration, between Apr. 3 and Apr. 10, approved 177 new or expanded facilities amounting to $513 million for accelerated tax amortization. Of the 177, certificates of necessity were granted to 72 facilities costing less than $100,000 to encourage small plant expansion.

The largest authorization went to the Pennsylvania Power & Light Co., Sunbury, Pa., for $36.9 million, of which 55 per cent was allowed for quick write-off.

Including the most recent list, a total of 9169 facilities valued at about $17.6 billion have been approved. Of this amount, approximately 63 per cent, or $11.1 billion, is certified by DPA for fast tax amortization.

Curtiss-Wright Plans Expansion

Curtiss-Wright Corp.'s Metal Processing Division, Buffalo, N. Y., has plans for an expansion program costing between $5 million and $10 million. The program includes erection of a new plant on Northland avenue in addition to the new $5 million plant now under construction. The expansion is expected to add between 1500 and 2000 persons to the payroll.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

ALUMINUM—Amendment of Apr. 24, 1952, of NPA Order M-26 removes all restrictions on the sale, delivery and use of aluminum closures and closure liners. M-26 now applies only to tin plate. Special inventory limitations of M-26 have been deleted. Inventories of tin plate and aluminum closures will continue to be regulated by NPA Regulation 1. The quantity of aluminum used for closures and closure liners will continue to be controlled by CMP allotments to manufacturers. The amendment was effective Apr. 24.

NEW PRODUCTS—Under Direction 1 to NPA Order M-47B, allotments of controlled materials granted for production of a new product cannot be used immediately to make something else. Usually, allotments may be shifted among any items listed within a group on M-47B's schedule. When a producer receives an allotment under a new product code all his production under that code is excepted from flexibility until he has used the amount of the principal controlled material so allotted, both for that quarter and the succeeding quarter. Until that time, material cannot be diverted either into or from the new product code. Direction 1 was issued Apr. 28, 1952, effective that date.

ALUMINUM—Amendment of Apr. 29, 1952, of NPA Order M-5 raises the aluminum producers' level of order acceptance from 100 per cent of authorized production schedules, excluding backlog, to 125 per cent, including backlog. The change, effective Apr. 29, was made to provide mills with a backlog of orders so that effects of cancellations will be eased.

SHIPPING DRUMS—NPA Order M-75 restricting sale, delivery, use and inventories of steel shipping drums was revoked Apr. 29, 1952. Steel shipping drums will remain subject to the 60-day inventory limitation of NPA Regulation 1.

Price Regulations

IRON ORE—Amendment 16 of General Overriding Regulation 9 exempts from all ceiling price restrictions the sales of iron ore between affiliated corporations. Amendment 16 was issued Apr. 23, 1952, and made effective Apr. 28.

FERROALLOYS — Amendment 17 of General Overriding Regulation 9 suspends price control from sales by metallurgical producers of experimental ferroalloys, ferrometals and ferrometal compounds, until such sales total $25,000 for any commodity or $100,000 for any category. Amendment 17 was issued Apr. 24, 1952, effective Apr. 29.

Housing Curb Needless—NAHB

Regulation X, dubbed regulation "Axe" by the National Association of Home Builders, is the only obstacle to buying a new home in literally thousands of cases, says Alan E. Brockbank, NAHB president. Since "the threat of inflation has long since disappeared, the predicted scarcity of materials has never appeared, and defense production needs are being more than adequately met," he says, the credit curb should be removed to open the market for low income workers desiring to buy homes.

Meanwhile, the Housing and Home Finance Agency announces that more than 12,000 units of programmed defense housing were put under construction as of Apr. 16 with some 1,600 of them completed. Applications from builders were approved for 61,662 units or 94 per cent of the 65,565 housing units thus far programmed for 114 critical areas.

Navy Gets $581,016 for Scrap

The U. S. Navy, primarily a seagoing outfit, is a heavy contributor to a landlocked project, according to February reports of scrap sales. The Office of Naval Material reports that the Navy realized $581,016 from sale of all types of scrap in that month.

Ferrous scrap headed the list at $445,938, followed by aluminum, brass and magnesium scrap at $64,233. Mixed and nonmetallic scrap comprised the remainder.

Regional RFC Men Make Loans

Lending authority was returned to regional Reconstruction Finance Corp. managers on a limited scale effective May 1. The agency's 31 regional offices will be permitted to make loans up to $50,000 on regular RFC loans. Any credits authorized by the Defense Production Act and questions of loan policy will be handled by the Washington office.

Last June, W. Stuart Symington, then administrator of the agency, took all lending authority away from the regional managers. At that time the local managers had authority to make RFC business loans up to $100,000.

STANLEY ANDREWS
. . . named TCA administrator

Appointments in Washington

Stanley Andrews is the newly appointed administrator (subject to Senate approval) of the Technical Cooperation Administration, the top government agency for technical and economic assistance to foreign nations. Mr. Andrews is the former director of the Office of Foreign Agricultural Relations, Department of Agriculture. He recently completed an inspection tour of the Middle East and South Asia for the Technical Cooperation Administration as a special consultant to the Secretary of State to assist in the development of the Point Four Program.

Dr. Gerhard Colm, formerly an economist with the President's Council of Economic Advisors, was appointed chief economist, National Planning Association.

James Albert Colvin, of the Northern States Power Co., Minneapolis, is to become director, Engine & Turbine Division, National Production Authority, May 9.

Earl D. Johnson, formerly assistant secretary of the Army for Manpower & Reserve Forces, was appointed assistant army secretary for Procurement, Research & Development.

James F. King was appointed United States representative on the Central Group of the International Materials Conference. Mr. King had been deputy administrator for resources expansion, Defense Production Administration.

Donald F. Kigar, of the Detroit Edison Co., was named director of the Materials & Equipment Division, Defense Electric Power Administration, Department of the Interior.

J. F. Farnam, manager of industrial and contractor sales of the wire & cable department, General Electric Co., was appointed deputy chief of the Wire Mill Branch, Copper Division, National Production Authority.

J. Kenneth Rankin, of the Creative Metals Co., Emeryville, Calif., was appointed a member of the Tackle Block Manufacturers Industries Advisory Board, National Production Authority.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

NPA's troubleshooting Business Advisory Service can find answers to problems ranging from allotments to outhouses . . . Uncertainty remains in RFC loan publicity policy

IF YOU HAVE a problem growing out of NPA regulations and policies—and can't get an answer from your nearest Commerce Department field office—try NPA's Business Advisory Service, 2 N6 GAO Bldg., Washington. It can be called at STerling 5200, Ext. 5381.

Here you'll find a staff of experienced businessmen, mostly retired, who have proven extremely resourceful in helping businessmen.

Emergency Facilities—Latrines were the subject of one problem to which the BAS obtained a solution. The state of Maine wanted to build three outhouses in a public park but couldn't go ahead because of the ban on recreational building projects.

BAS obtained from NPA's legal division a ruling that although public parks are recreational facilities, latrines in those parks definitely are not for recreation. The latrines were given the green light, solving a fundamental problem.

Troubleshooting—Here are some of the questions on which BAS recently has given positive help (it doesn't want the answers published, as they might change from time to time):

Does the high-nickel alloy prohibition apply to domestic as well as to industrial electric appliances? May a producer reject a CMP order bearing the symbols A, B, C, E, or Z-2? Can a small manufacturer self-certify under provisions of Dir. 1, CMP Reg. 1, up to the maximum specified for small users? When does an A product become a B product?

Help Abroad—Recently a Pittsburgh company placed an order in Germany for a complete oxygen plant, but the German manufacturer couldn't get the needed copper and aluminum. Through BAS intervention, allotments of copper and aluminum needed for construction were cleared for the manufacturer and the oxygen plant shortly will be shipped to Pittsburgh.

Relaxation Preferred

THE REASON why Manly Fleischmann, DPA administrator, eliminated the word "decontrol" from his vocabulary is that this word denotes an end to controls—and Mr. Fleischmann does not want anybody to think along these lines for the present. He prefers the word "relaxation" when referring to the easing of controls.

DPA and NPA must be prepared as long as the present emergency endures, says Mr. Fleischmann, to reapply controls where necessary, and it would be a mistake to encourage a "business as normal" psychology. For the present, he says, the trend is decidedly toward relaxation; all NPA orders are being studied with the view of easing them wherever possible.

Quartermaster Designs . . .

Metalworking companies will be hearing a lot about the new Quartermaster Research and Development Center, for which ground has been broken at Natick, Mass. There the designs of many fabricated items will be determined and the specifications for related problems of materials selection and protective coatings will be developed.

Units devoted to metals research and development include a Tools, Hardware and Miscellaneous Equipment Laboratory, a Cooking, Baking and Heating Equipment Laboratory, a Materials Handling Equipment Laboratory, a Fabricating Shop, a Testing Laboratory, and a Protective Finishes Laboratory.

Seek Tough Defense Jobs . . .

Companies seeking defense work should obtain from the U. S. Chamber of Commerce, Washington, the new booklet entitled "Subcontracting for Defense—How to Sell to Companies Holding Defense Contracts."

The best approach, says the 36-page booklet, is to find the tough jobs. "Locate the bottleneck that is slowing output on a prime contract, then show the contractor how to meet his difficulties through use of your plant under subcontract."

Another recent Chamber of Commerce publication is entitled "Defense Contract Pricing," which title is self-explanatory.

Equipment manufacturers, shippers, and businessmen in general may find helpful the new National Bureau of Standards book *Federal and State Weights and Measures*. This 1182-page volume includes all federal and state laws (through 1949 enactments) in this field, with a painstakingly detailed index. Price: $5.75, from Superintendent of Documents, Government Printing Office, Washington 25.

Publicizing RFC Loans . . .

Under policy announced by RFC Administrator Harry A. McDonald, firms borrowing or attempting to borrow from the government can't be sure of the publicity they will receive.

RFC will continue to publicize loans so that the public will know to whom, how much, and for what purpose the government is making loans.

Under this policy, RFC does not usually release information that might adversely affect the credit position or other status of the applicant. Generally the RFC does not announce who has applied for a loan or whether applications have been granted.

"There are," says Mr. McDonald, "certain cases of such magnitude and broad significance as to warrant exceptions to the general rule of not announcing applications and declines. The administrator will judge each case on its merits to make certain that in no event will unfairness, inequities or other damage to the applicant result from RFC releases."

Morgan Guide Grinder

produces accurate twist guides

One of the important factors contributing to the smooth operation of your rolling mill . . . and higher product quality . . . is the accuracy of your twist guides.

This Morgan Guide Grinder was specifically designed for that purpose. It is hydraulically operated and imparts the correct degree of twist with smooth accurately formed grooves. Ground guides eliminate scratching and deliver a higher quality product.

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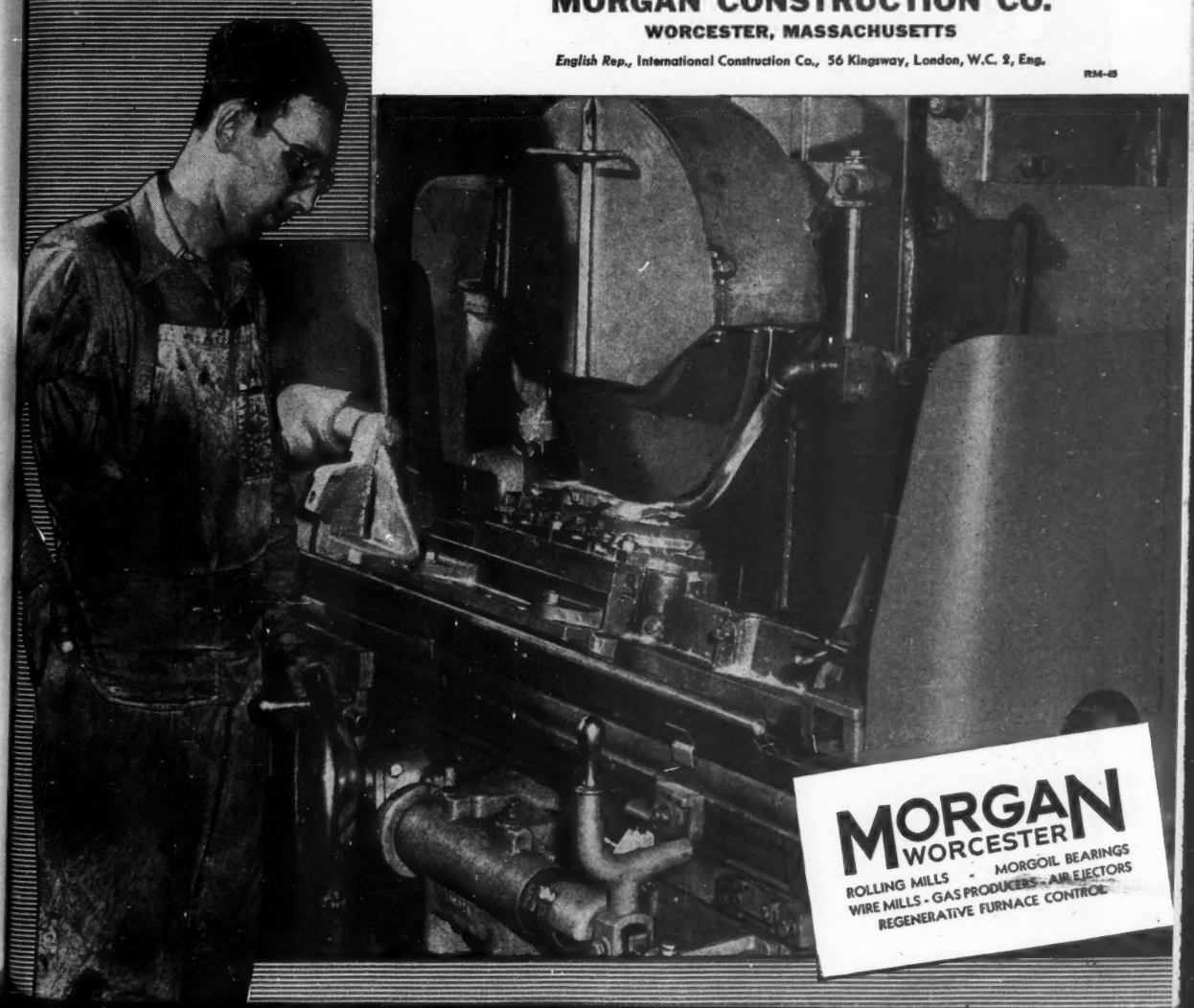
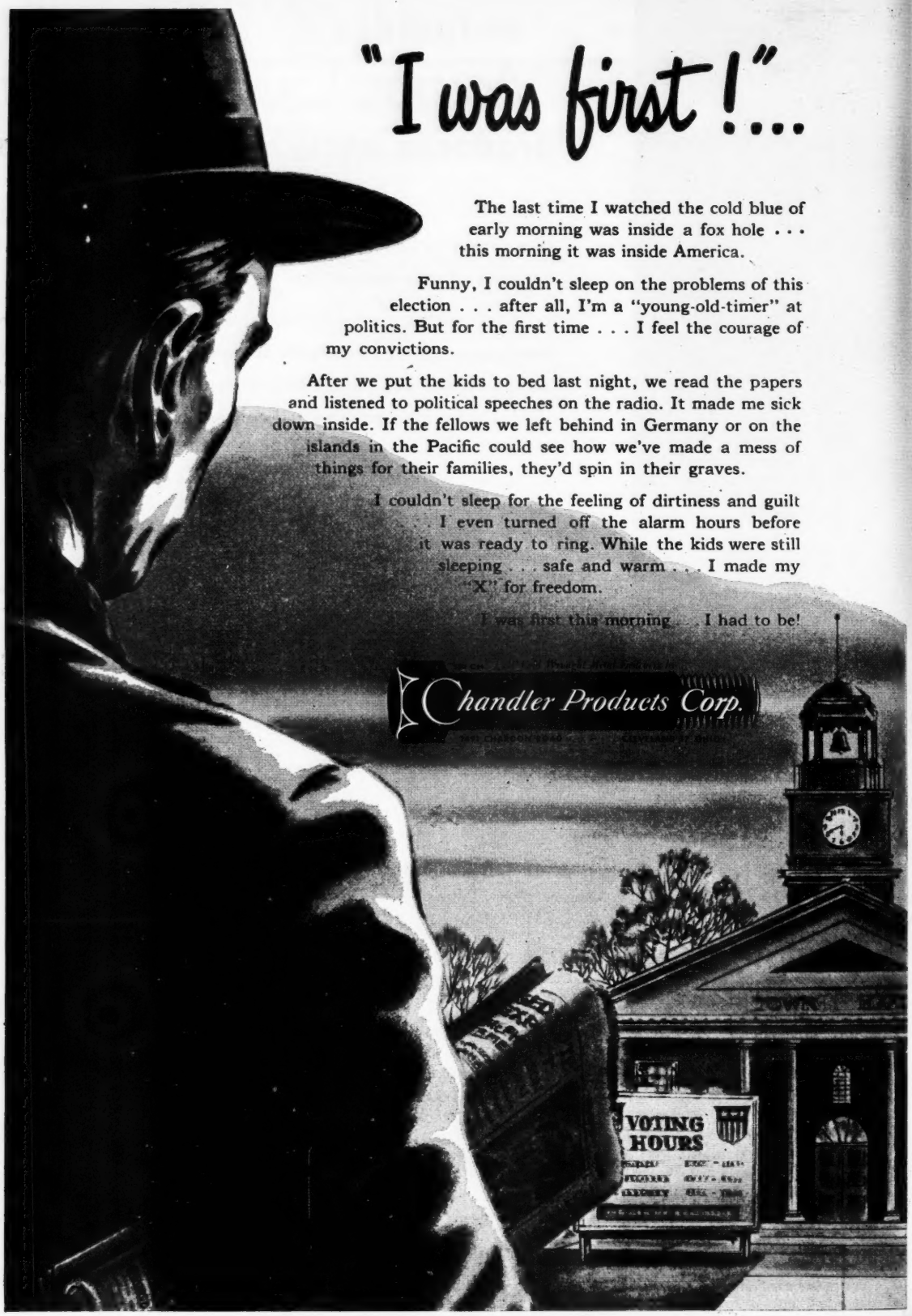
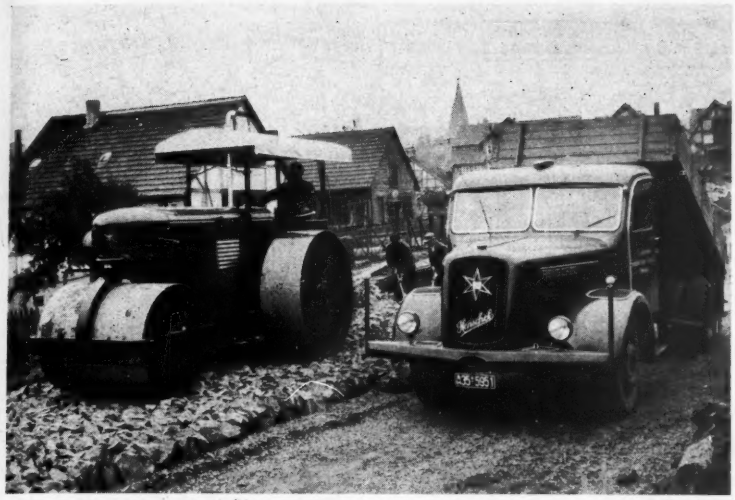



"I was first!"...
The last time I watched the cold blue of early morning was inside a fox hole . . . this morning it was inside America.
Funny, I couldn't sleep on the problems of this election . . . after all, I'm a "young-old-timer" at politics. But for the first time . . . I feel the courage of my convictions.
After we put the kids to bed last night, we read the papers and listened to political speeches on the radio. It made me sick down inside. If the fellows we left behind in Germany or on the islands in the Pacific could see how we've made a mess of things for their families, they'd spin in their graves.
I couldn't sleep for the feeling of dirtiness and guilt . . . I even turned off the alarm hours before it was ready to ring. While the kids were still sleeping . . . safe and warm . . . I made my "X" for freedom.
I was first this morning . . . I had to be!
Chandler Products Corp.
VOTING HOURS



Authenticated

Latest in the Line

The Henschel and Sohn Motor Works, Kassel, Germany, is displaying models of its latest line of vehicles. At left is a diesel-engine powered three-wheel road roller. The truck at right can be equipped with either rear or side dump. The company also manufactures many types of autos, busses, vans and tank tracks

Pitfall of Policy: Improved Foreign Imports

Europeans have changed their way of doing things and sometimes their style, trying to get a slice of the American market. But, now they're worried about protective duties

IS THE U.S. practicing what it preaches? That's what Europeans are beginning to ask.

After the U.S. was out in front in forming the International Trade Organization, it has not yet joined the ITO. After promoting the General Agreement on Tariffs and Trade, the U.S. has imposed duties on imports of cheese, milk products and casein. After two years of waiting, the customs simplification act that would assist the American importer, and thus, the foreign exporter, has not yet been legislated into law.

Means to an End—Through the use of the so-called "escape clause" contained in most American trade agreements, duties have been raised on fur-felt hat bodies, almonds and cheese. Legislation is pending in Congress which would enable duties to be raised on motorcycles, bicycles, wines, pottery, tobacco, pipes and wood screws. The escape clause allows for raising duties on items where the domestic manufacturer has been seriously injured by foreign competition.

All this comes as a surprise to Europeans who have heard much from the U.S. about lowering tariffs to promote trade within Europe and with America. Canada, the Netherlands, Denmark, Italy, France and New Zealand have indicated that they will revert to protective tariffs, too, unless the U.S. begins to act upon its own text (STEEL, Apr. 28, p.55).

Unsolicited Reaction—The British government said in a note to this country: "British exporters are perturbed by the mounting evidence that any marked success in selling their goods in the U.S. will be countered by applications from U.S. industry for further protection and the fear that at least some of these applications may be granted."

American industry splits into two main groups over the question: One group is opposed to protective duties since this tends to lessen the trade from foreign countries and holds down dollar credits of people who are potential customers. The other group of American business men favor protective tariffs because they make products that can be undersold by foreign competition.

Scrap Export Quotas Set

The second quarter export quota of scrap has been set at 36,000 tons, including no more than 26,500 tons of scrap in open-hearth grades, says the Office of International Trade. In addition, OIT can license 10,500 tons of cast iron scrap (unstripped motor blocks) for export to the United Kingdom.

The second quarter scrap quota, larger than the first quarter allotment by 11,000 tons, reflects improvement in the supply of some grades of scrap.

U.K. Boosts Steel Output

The most crippling shortage in steelmaking in the United Kingdom remains—scrap. Attempts to boost pig iron production in the face of the desperate scrap situation have resulted in a rise of 250,000 tons in imports of iron ore for the first two months of 1952 over the like period last year. Coke and coking coal are inadequate, though, to keep all blast furnace capacity operating. Stocks on the ground at the furnaces represent only four days' supply.

Despite the difficult supply situation, output of steel ingots and castings in March was at an annual rate of 16,648,000 tons compared with 16,281,000 tons in February and 16,456,000 tons in March, 1951. Pig iron production was at an annual rate of 10,478,000 tons in March, 1952, against 10,263,000 tons in February and 9,572,000 in March, 1951.

IBRD Straddles the World

During the period from July, 1951, to March, 1952, the International Bank for Reconstruction and Development made 14 loans amounting to $212,658,000 in Belgium, the Belgian Congo, Chile, Colombia, Iceland, Italy, Mexico, Netherlands, Nicaragua, Pakistan, Paraguay, Peru, Southern Rhodesia and Yugoslavia.

Canada, the United Kingdom and the U. S. have authorized the Bank to relend the proceeds of any repayments on loans made out of their 18 per cent capital subscription.

Coming Up: New Life for LIFO

Get behind legislation pending in Congress that will permit greater use of the last-in, first-out method of inventory pricing. It can mean lower taxes for you

SURGERY some congressmen propose to perform on the Internal Revenue Code can mean new life to LIFO—and lower taxes to you through more accurate profit reporting.

LIFO, the last-in, first-out method of inventory pricing, eliminates paper profits on inventories when the price level is rising and, hence, does away with the tax on those fictitious profits.

Inflated Profits—If you use the more commonly accepted pricing method of FIFO on inventories (first-in, first-out), you get an inventory profit when prices rise and must pay income taxes on it. Inventories of corporations using FIFO have risen in dollar value an estimated $25 billion in the past decade solely because of inflation.

That has been reported as "profit" under FIFO even though it has not yet been realized. Taxes have been paid on it, and dividends and other distribution have been based on it. To the extent that prices recede, inventory write-offs under FIFO will reduce taxable profits in the future. Thus FIFO even works against the government in that the Treasury can't tell precisely what its true revenues are.

Dragging Its Feet — Yet since 1938 LIFO has been accepted only with reluctance by the Bureau of Internal Revenue. So rigid have been the bureau's rulings about it that probably less than 15 per cent of business uses the technique.

Legislation pending in Congress will liberalize the regulations about LIFO and permit wider use of the accounting technique. Rep. Sidney A. Camp (Dem., Ga.) and Rep. Dan A. Reed (Rep., N. Y.) have introduced identical bills in the House that will have the liberalizing effect. A Republican and a Democrat put companion bills in the hopper to show the non-partisan nature of the proposal, and the action augurs well for eventual House approval. The Senate Finance Committee's general attitude is favorable to sound business practices. But strong popular support of the proposal is needed to assure passage and "every American business man can make a contribution to a sounder economy by endorsing the Camp-Reed measure," says H. T. McAnly, partner in the accounting firm of Ernst & Ernst and a longtime advocate of LIFO.

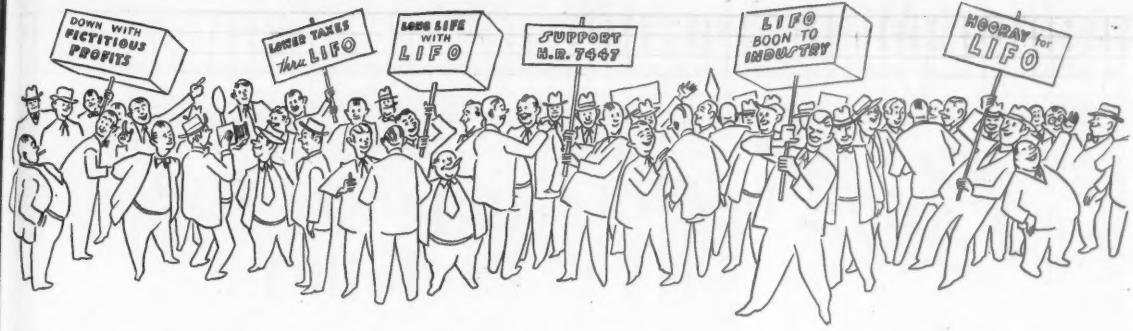
Standardize—"I believe," he told STEEL, "that the time has arrived to establish LIFO as the universal method of pricing inventories in the determination of income." He's not the only top accountant and business man who thinks so. Rising taxes and rising price levels dictate that what was once only an accountant's technical problem today deserves the attention of every top management man.

LIFO had its beginning in the old base-stock method of inventory valuations used by industries such as mining and smelting that have simple, unperishable, easily measured inventories. The thinking on base-stock was that a company had to have a base stock of materials to conduct business just as a manufacturer has a basic plant and equipment to turn out goods. The basic plant and equipment was—and still usually is—carried at original cost even if land and other prices fluctuate over the years. Why shouldn't a basic inventory also be carried at the original cost just like plant and equipment, despite subsequent price changes and despite the fact that there is a constant turnover in inventory?

For a While — That inventory pricing philosophy was followed by a few American companies until 1930 when the Supreme Court disallowed it for income-tax determinations because the tribunal held that the base-stock idea is only an accounting fiction. After the ruling, several companies involved figured out a theory that would permit them to do almost the same thing. Their solution: LIFO. Their argument: The modified technique represents an assumed flow-of-goods concept which conforms more nearly to business pricing practices. The last material to be added to a stockpile, lead, for example, is also the first to be taken.

"In effect," says Mr. McAnly, "those companies wanted permission to price their lead in the ending inventory as though it were on hand in the beginning inventory. One million pounds of lead at 5 cents a pound at the beginning of the year would represent a $50,000 beginning-inventory investment. If 1 million pounds existed at the end of the year and the current cost at that point equals 7½ cents a pound, the mechanics of LIFO would permit the valuing of the 1 million pounds at the beginning-of-the-year price level of 5 cents, thus removing the inflation."

Go to Congress—The companies advocating LIFO in the 1930s got nowhere with the Treasury Department and finally had to approach



Congress which in 1938 wrote LIFO into the revenue law for a limited group of industries. That immediately brought charges of discrimination from other industries, and the law was broadened in 1939 to include all taxpayers. Treasury's interpretation of the act, however, limited the application to industries having simple, homogenous inventories.

That interpretation went unchallenged for a while because the seriousness of the coming inflation was not yet apparent. But by 1941 it was, and paper inventory profits became a serious problem. LIFO could prevent that—if interpreted more liberally. What mechanics could be developed to apply LIFO to companies with complex inventories difficult to measure?

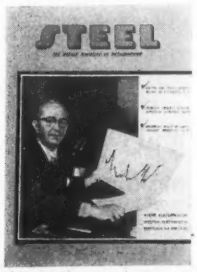
Suggestion — Mr. McAnly, in May, 1941, first suggested the mechanics, now widely known as the LIFO Dollar Value Method. The technique relies on price indexes for whole groups of items as a way of determining changes in aggregate quantities of physical inventories. Under that theory, XYZ Mfg. Co. at beginning of a fiscal year might have an inventory of hundreds of items worth $1 million altogether. Over the years it makes no difference what particular items are included in the inventory. The index numbers are used to adjust the total dollars of inventory for price shifts.

But Treasury refused to accept the index idea, and many companies that had embraced the concept in the early 1940s dropped it. Not all, though. A test case was planned involving Hutzler Brothers, a Baltimore department store. With Mr. McAnly as the professional accounting witness, the Hutzler case was fought for years until finally the tax court ruled in favor of the taxpayer in 1947, retroactive to 1941. (Because department stores took the lead in getting Treasury to change its ways on LIFO, the misconception has arisen that when it comes to complex inventories, LIFO is suitable only for large retail operations. LIFO can be of potential benefit to any company that carries sizable inventories).

Hollow Victory?—"The Hutzler decision," says Mr. McAnly, "was a victory for LIFO, but it has turned out thus far to be almost a Pyrrhic one. In 1947 when the decision was handed down, less than 10 per cent of all inventories were reported on a LIFO basis. Today, the percentage is less than 15."

Why such a poor showing for LIFO? For one thing, Treasury didn't get the Hutzler revision into its regulations until November, 1949, two years after the decision. For another, while some companies switched to LIFO in the early 1940s, betting that Hutzler would win, relatively few in the country actually took the chance. Some couldn't because they didn't even exist in the early years. As a result, most firms today don't dare switch to LIFO—because of another regulation still in force.

High and Dry—That ruling requires that when a company switches to LIFO, the price level in effect at the time of the move becomes the firm's base inventory price. With the wholesale commodity index near alltime highs, most economists think we're near the apex in the present cycle. Consequently few companies want to go to LIFO now and be stuck at a high price level for the rest of their corporate existence (once you switch to LIFO, you have a tough time switching back to FIFO, according to Treasury policy).



Accountant H. T. McAnly, in this STEEL interview, analyzes the significance of LIFO and shows how its use in inventory pricing can give you a truer picture of your profits

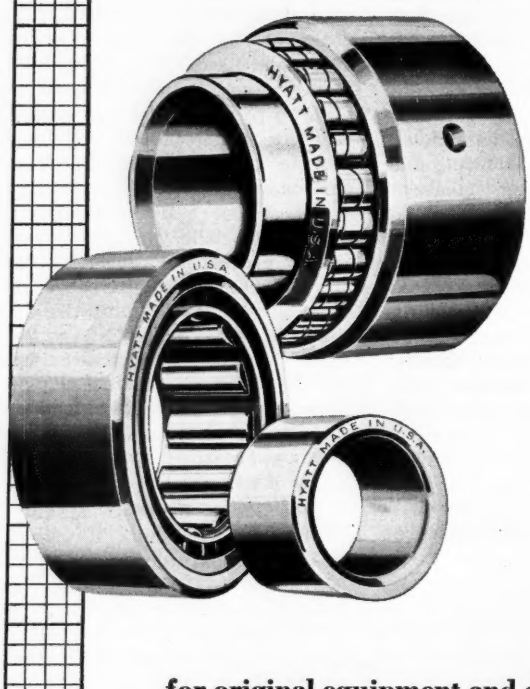
Purpose of the Camp (H. R. 7447) and Reed (H. R. 7554) bills is to revise the Internal Revenue Code to permit a taxpayer, within limits, to switch now to LIFO and still be able to adjust his base price downward if the price level drops. Under provisions of the Camp-Reed bills, companies can make permanent reductions in their inventories to market value from Jan. 1, 1952, until the excess profits tax ends and for five years thereafter. After that period, further reductions to market will be recognized, but those reductions may prove temporary since they must be restored to income if prices increase.

True Story—Says Mr. McAnly: "The Camp-Reed bills, if passed, make possible universal use of LIFO, and LIFO is a major step toward true profit reporting."

The lack of knowledge about profits—their extent, their true nature—is at the heart of many of today's economic and labor problems, the Ernst & Ernst man believes. Like a doctor operating on a patient with only a hazy idea of the condition of the man's heart, many people today in labor and government would do economic surgery—without knowing if the economy's heart can stand it.

Profit by Mill Equipment With HYATTS Built In

Take ingot and charging cars in leading steel mills for instance—90 per cent of them roll on Hyatt Roller Bearings.



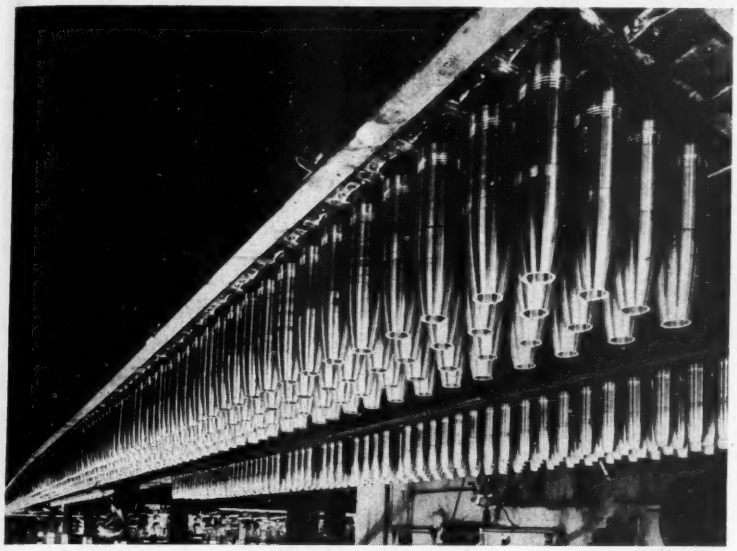
Mill men have proved to their own satisfaction that Hyatts can take the shock and carry the loads month after month in a wear-free, care-free manner that pays a profit.

So also in tables — cranes — mill motors — and other auxiliary steel mill equipment, Hyatt Roller Bearings have been for many years, and continue to be, the preferred bearings for steel mill work, both for original equipment and changeovers. Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.

HYATT ROLLER BEARINGS

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom



United Press

Chevrolet, Ford Shoot the Works for Defense Effort

Indicative of the part the motor capital is playing in the defense effort are these two scenes. At left, an assembly line of 2000 Chevrolet-built artillery shells awaits the last of 44 distinct inspections. Chevrolet also makes aircraft engines, tank gear assemblies and drive units and components for military trucks. At right, an inspector checks 3.5-inch bazooka rocket heads which Ford Motor Co. makes at its Highland Park, Mich., plant. Ford has made more than 1.2 million of the bazooka rocket heads since they were put in production in June, 1951

A congressional report on the Detroit Tank Center is highly critical. If recommendations are followed, more companies will be able to win negotiated contracts

DETROIT

"THERE'LL BE some changes made" was the theme song of the report written by a subcommittee of the House of Representatives' Committee on Expenditures after a two-year study of the operations of the Detroit Ordnance Tank-Automotive Center.

The subcommittee's report got scant public notice. There are in it, however, implications of extreme importance to automakers and parts manufacturers which would do business with the government.

Loaded—Loaded with instances of selling and buying practices which had added to the cost of vehicle parts, the report went over much of the ground which had been thoroughly spaded when the committee was last in Detroit (STEEL, Dec. 24, 1951, p. 39).

Although the automotive industry had carefully explained why many parts can be sold better by the distribution specialists of the vehicle assemblers than by the manufacturers themselves, Rep. Porter Hardy Jr.'s committee's report roundly condemns this practice. As the largest single buyer of automotive parts, the government should be able to make its purchases directly from the makers, the committee believes. Less than 30 per cent of Ordnance's buying is through middlemen, but the move is on to cut this percentage to the bone.

Under Fire—The unwillingness of many parts manufacturers to enter reasonable bids also came under the committee's guns. Long established trade practices of the automotive industry may be due for a going-over by the Federal Trade Commission which was asked to come into the picture in the committee's report. Cited by the committee was at least one company whose high bids were entered, only so that its name would be kept on OTAC's invitation-to-bid list.

Government buying officers also came in for their share of criticism. They are accused of "following a blind path, thinking they were powerless to do other than advertise for bids and accept the lowest bid." Time and money spent by the center in sending out invitations to bid has been futile when it is known that only one manufacturer can make the wanted item. In such cases contracts should be negotiated directly, the committee advised.

Big Business — From a parts manufacturer's point of view there is a lot of government business to be had. In the next few years $1 billion worth of auto parts will be bought by the government each year. The government will be on the alert that the prices charged do not include "economically unsupportable elements of cost." One

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of these will be the commission charged by the "parasitic" type of middleman. The committee makes a distinction between the legitimate manufacturer's agent, who deserves the commission he gets for conducting sales with the government in behalf of small firms, and the G.I.P., or government influence peddler, whose "five-percener" appellation has brought a certain amount of discredit to all.

If the committee's recommendations are followed by OTAC there will be more chance for manufacturers to obtain negotiated contracts, and more encouragement for individual companies to sell direct. It may be necessary for some companies to establish contact with the armed services' procurement instead of staying in the background and acting as suppliers to outfits which have had the contracts.

GM Personnel Move Up

Sweeping personnel changes have been announced by General Motors Corp. and two of its car divisions. All of the appointments became effective May 1.

Hugh Dean, vice president of GM in charge of the manufacturing staff, retired after 37 years with the corporation. Named to succeed him as executive in charge of the manufacturing staff is John J. Cronin, until now general manager of Fisher Body Division.

James E. Goodman, general manager of the Buick-Oldsmobile-Pontiac Assembly Division, becomes general manager of Fisher Body. Before joining B-O-P in 1947, Mr. Goodman had been with Fisher Body in such positions as resident manager of Norwood, O., Oakland, Calif., and Flint, Mich., plants, director of Fisher's Tank Division during the last war and general manufacturing executive.

James L. Conlon, general manager of GM's Ternstedt Division, takes over as general manager of B-O-P. He has been with GM for 27 years, chiefly in executive capacities with Ternstedt.

Leo R. Schreiner, until now resident manager of Ternstedt's Trenton, N. J., plant, lives a Horatio Alger success story by becoming general manager of the Ternstedt Division. He joined Ternstedt as a die maker in Detroit in 1923.

Auto, Truck Output
U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,692	658,918
March	517,206	792,550
April	561,000*	680,281
May		695,898
June		653,682
July		522,858
August		571,442
September		505,758
October		558,971
November		480,199
December		402,729
Total		7,179,161

Week Ended	1952	1951
Mar. 22	125,347	174,953
April. 5	125,668	158,076
April. 12	123,180	162,839
April. 19	131,657	166,502
Apri. 26	135,769	162,740
May 3	130,000*	154,523

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

In Chevrolet Motor Division, E. H. Kelley, chief engineer, has been appointed general manufacturing manager, succeeding W. J. Scott, who has been appointed executive assistant in charge of manufacturing. Mr. Kelley joined the division in 1928 as a designer, was appointed chief engineer of the aviation engine division at Tonawanda, N. Y., in 1941, assistant chief engineer of Chevrolet in 1945 and chief engineer in 1949. Mr. Scott began work with Chevrolet in 1915, became Detroit forge plant manager in 1934, plant manager of Detroit forge, gear and axle plants in 1939, and in 1945 was made assistant manufacturing manager in charge of manufacturing plants. He has held the position of general manufacturing manager since 1949.

Succeeding Mr. Kelley as chief engineer, Chevrolet, is Edward N. Cole, until now plant manager, Cleveland Tank Plant, Cadillac Motor Car Division. A graduate of the GM Institute at Flint he went to work at Cadillac and became chief design engineer for Cadillac light tanks in World War II. In 1946 he was named chief engineer of Cadillac and since 1950 has headed the Cleveland T-41 producing plant.

Harold R. Boyer, well known for his bottleneck-breaking activities in Washington as chief of aircraft production in the Defense Production Administration, ends his leave of absence from GM to take over as plant manager of Cadillac's Cleveland Tank Plant. Mr. Boyer was president and general manager of Allen Corp., Detroit, from 1930 to 1940 and joined the War Production Board in 1940 as chief of the aircraft manufacturing branch. Named assistant to the manufacturing manager, Chevrolet Division, in 1943, and in 1945 manager of Production & Standards Department, Mr. Boyer became director of the GM production engineering section in 1946.

Chrysler Veteran Retires

At Chrysler Corp., D. S. Eddins, for more than 17 years president of its Plymouth Division, has retired. He joined Chrysler in 1933 as a member of K. T. Keller's staff. Mr. Keller was then vice president in charge of manufacturing and president of Dodge Division. In April, 1934, Dan Eddins was named Plymouth vice president and general manager, becoming president of the division that December. A veteran automaker and seller, serving his apprenticeship in Studebaker and Maxwell, Mr. Eddins had been assistant general sales manager of Chevrolet Division, general sales manager of Olds Motor Works in 1925, then successively general manager, vice president and president of Olds. He was on the staff of GM's vice president in charge of sales when he resigned to join Chrysler.

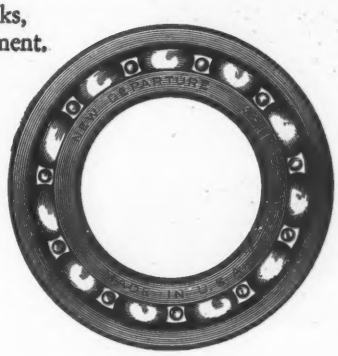
Hudson Sales Deal Folds

The peculiar proposition offered by Oster & Barry Motor Sales, Detroit Hudson Dealer, back in March (STEEL, Mar. 10, p. 92) by which a new car buyer was promised a new one of the same model at no charge after six months or 10,000 miles of use, had a sad ending.

Its Hudson franchise was terminated by the auto builder for "lack of capital" and buyers (if any) under this plan are left holding the bag. Despite Mr. Barry's statement when the offer was made that "maybe the factory will back us up," there was no agreement with the company to that effect.

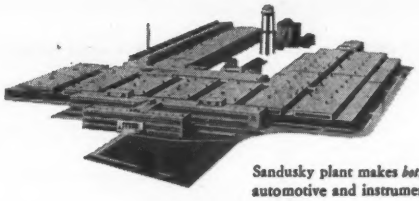
"swords *and* plowshares"

At this very moment, New Departure's three great plants are turning out thousands of ball bearings for both industry *and* the Armed Forces—for trucks *and* tanks, jig borers *and* jets, household appliances *and* electronic equipment.



Because all New Departure ball bearings are of the same materials, receive the same heat treatment, are manufactured by the same precision methods, conversion from one to the other at New Departure is largely a matter of changing the emphasis on types and sizes.

Whatever *your* bearing requirements, feel free to call on New Departure. Its engineers, vast research facilities, and the tremendous capacity of its "guns-and-butter" plants are your assurance of the best possible production schedules.



Sandusky plant makes *both* automotive and instrument bearings.

Nothing Rolls Like a Ball...

NEW DEPARTURE

BALL BEARINGS

165

NEW DEPARTURE • DIVISION OF GENERAL MOTORS CORPORATION • BRISTOL, CONNECTICUT

The steel that jet-propels a truck

ON a day last spring, one truck driver after another blinked in amazement as a large red truck barrelled along a western highway. The reason: a pair of uncommonly large exhaust stacks jutting up beside the cab, but a complete absence of the customary "pop-pop" from a diesel truck engine. It was the first truck in the world to be powered by a gas turbine engine!

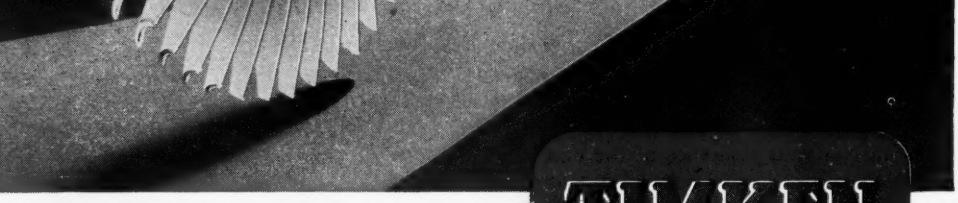
Still in the trial-run stage, this Kenworth truck's Boeing gas turbine engine promises tremendous benefits to truck operators. Its weight is only one-tenth that of the standard diesel engine now used for heavy-duty service. It occupies 60% less space. It gives faster pick-up and less noise.

One big problem which had long stood in the way of developing gas turbines like this was the lack of a satisfactory steel for the turbine's wheel discs. These wheels, heart of the engine, must spin as fast as 36,000 rpm —and in an inferno of hot gases that would reduce ordinary steels to a semi-molten state.

But metallurgists of The Timken Roller Bearing Company had the answer all ready for the engine manufacturer. It was "16-25-6"—an alloy developed by The Timken Company that had been proved in jet airplane engines and recently used in large, stationary gas turbines. Recommended by the Timken Company for the Boeing turbine wheel discs, "16-25-6" did the job—retained its strength at 1500°F., withstood all the terrific forces involved.

It's one more problem that can be stamped "Solved—by Timken Alloy Steel". Why not let us help with your steel problem? Write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO". Tapered Roller Bearings, Alloy Steels and Seamless Tubing, Removable Rock Bits.

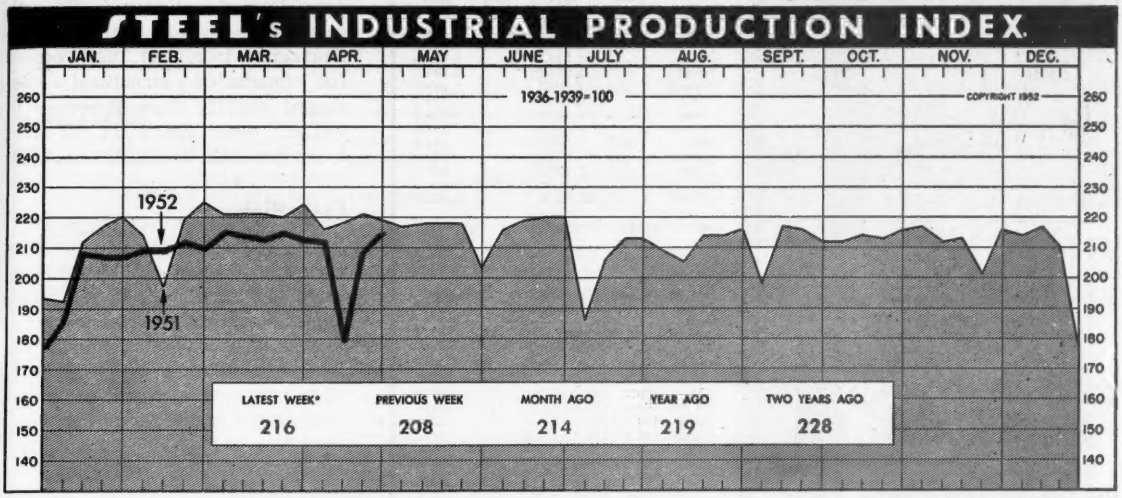
YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



TIMKEN
Fine Alloy
STEEL
and Seamless Tubes

COPR. 1952 THE TIMKEN ROLLER BEARING COMPANY

The Business Trend


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1936-1939=100
COPYRIGHT 1952
260 250 240 230 220 210 200 190 180 170 160 150 140
1952
1951
LATEST WEEK* 216
PREVIOUS WEEK 208
MONTH AGO 214
YEAR AGO 219
TWO YEARS AGO 228

* Week ended Apr. 26

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

Industrial production index returned to high levels before the steel industry strike. Purchasing agents show increased signs of caution

INDUSTRIAL ACTIVITY was moving sidewise before the steelworkers went out on strike.

STEEL's industrial activity index for the week ended Apr. 26 registered 216 per cent (1936-1939 = 100), where it was before the threat of an industry strike cut steel output deeply a few weeks ago. Gain over the previous week's mark is 5 points. A mainstay of the present high activity is the increasing amount of defense production.

Metalworking companies working on defense orders were doing business at a good clip, but many firms dependent on civilian orders felt a decided pinch. Reports of production cutbacks and frugal buying policies continue to roll in.

Indicating the growing pessimism among buyers is the report of the National Association of Purchasing Agents. The anticipated spring upswing in industrial activity hasn't materialized, says NAPA. Production declines in April were double the increases, despite the easing of materials. Of the buyers surveyed, 36 per cent said their companies experienced a sharp drop in order backlogs.

Contributing to the unfavorable business picture were the reports of an increasing weakness in price structure and inventory liquidations. On prices, the members' comment was that more quotations below ceiling prices would be made if suppliers were assured the reduced price would not be interpreted as a new ceiling price by the OPS.

Lower order bookings coupled with price weakness have made industry extremely inventory conscious. April saw an even more pronounced movement into the 30-to-60 day bracket, says NAPA.

Output Accelerated . . .

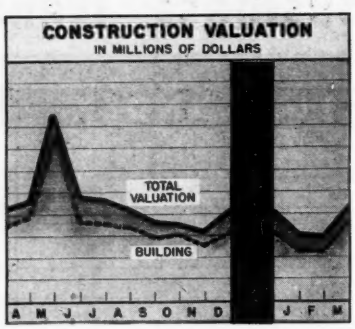
Despite the public's disinclination to spend, automakers are gearing for a sales upsurge in the late spring and summer months. Dealers are finding it easy to move passenger cars to buyers. Auto production is gaining momentum, and U. S. car production in April was the highest since August, 1951, estimates *Ward's Automotive Reports*. Assemblies are expected to spiral upwards, now that materials are easing. Combined U. S. and Canadian auto and truck production during the week ended Apr. 26 totaled 135,769 units, a rise of 4112 over the previous week's output and 26,971 units below the year-ago assemblies. Total April U. S. production is estimated at 418,000 passenger cars and 113,000 trucks, a 9 per cent rise above the March output.

Pushing Upward . . .

Construction activity is skyrocketing with the warmer weather. Total valuation of new construction jumped to $1321 million in March in the 37 states east of the Rocky mountains, says F. W. Dodge Corp. That's a $54 million rise over year-ago construction and the highest valuation since last July. March construction reached $436 million over the February figure. In the week ended Apr. 24, total awards for new construction in the U. S. rose to $371 million, says *Engineering News-Record*. That's nearly a $36 million rise over the total for the previous week and $195 million above awards received in the same week in 1951.

Following the Lead . . .

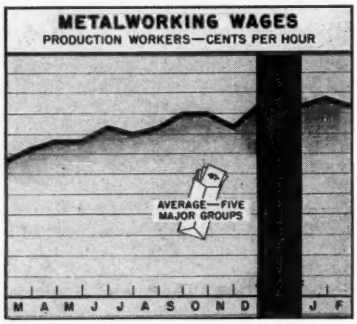
While construction activity is reaching skyward, shipments of fabricated structural steel are following suit. March shipments of the structural steel rose to 271,085



Construction Valuation
(37 States)—In Millions of Dollars

	Total		Building	
	1952	1951	1952	1951
Jan.	902.1	1,043.2	695.4	881.9
Feb.	885.2	1,140.5	697.8	962.3
Mar.	1,321.2	1,267.4	1,056.0	1,043.8
Apr.	.....	1,375.0	....	1,108.9
May	.....	2,573.0	....	2,295.0
June	.....	1,408.9	....	1,098.4
July	.....	1,379.8	....	1,084.7
Aug.	.....	1,262.8	....	1,043.5
Sept.	.....	1,082.9	....	884.2
Oct.	.....	1,051.4	....	914.4
Nov.	.....	931.8	....	771.6
Dec.	.....	1,234.3	....	939.1
Total	.....	15,751.6	....	13,027.9

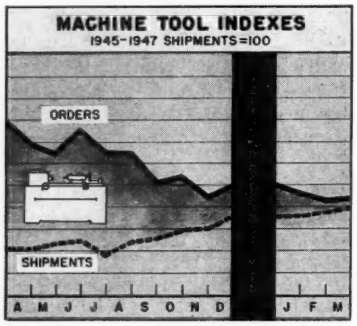
F. W. Dodge Corp.



Metalworking Hourly Wages
(cents)

	Production Workers—Five Major Groups				
1951	Prim. Mtls.	Fab. Prod.	Mach. inery	Elec. Mchy.	Trans. Equip.
Feb.	177.9	163.5	172.6	156.9	181.5
Mar.	179.7	165.2	174.5	158.2	183.8
Apri.	179.8	165.5	174.9	160.4	182.9
May	179.9	165.5	175.0	161.8	183.3
June	181.9	166.1	176.2	163.7	186.0
July	181.9	165.8	175.4	162.6	186.3
Aug.	180.2	166.3	176.6	164.0	186.7
Sept.	183.5	168.2	178.8	164.5	188.4
Oct.	181.6	168.8	179.4	164.9	188.5
Nov.	181.9	168.9	170.7	165.5	189.2
Dec.	183.6	170.0	181.7	167.0	190.3
1952					
Jan.	184.7	170.3	182.0	166.9	191.4
Feb.	183.1	170.5	183.0	166.8	190.3

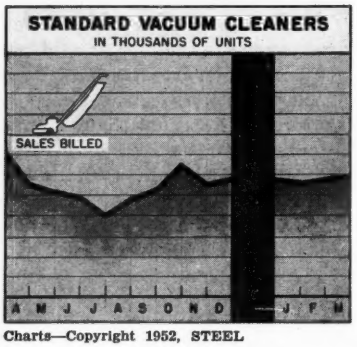
U. S. Bureau of Labor Statistics



Machine Tool Indexes
1945-1947 Shipments=100

	New Orders		Shipments	
	1952	1951	1952	1951
Jan.	347.8	475.4	266.6	114.3
Feb.	318.8	615.5	279.6	123.8
Mar.	327.1	590.3	293.9	158.9
Apr.	....	516.1	....	157.7
May	....	483.0	....	175.1
June	....	558.8	....	182.8
July	....	490.6	....	144.7
Aug.	....	488.9	....	178.9
Sept.	....	380.2	....	189.8
Oct.	....	403.9	....	221.3
Nov.	....	330.5	....	226.0
Dec.	....	376.5	....	264.7

National Machine Tool Builders' Assn.



Standard Vacuum Cleaners
Sales Billed—Units

	1952	1951	1950
Jan.	223.357	282,305	249,150
Feb.	230,226	261,572	263,515
Mar.	235,936	290,242	361,014
Apr.	.....	227,216	292,664
May	.....	201,983	278,645
June	.....	194,548	250,190
July	.....	161,002	279,967
Aug.	.....	191,299	341,232
Sept.	.....	210,086	327,524
Oct.	.....	259,469	331,445
Nov.	.....	219,919	265,310
Dec.	.....	230,263	288,756
Total	.....	2,729,104	3,529,414

Vacuum Cleaner Mfrs. Assn.

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Issue Dates of other FACTS and FIGURES Published by STEEL

Durable Goods Mar.31	Gray Iron Castings..Apr.14	Ranges, Elec. Apr.28
Employ., Metalwkg. Apr.21	Ironers Jan.21	Ranges, Gas Apr.28
Employ., Steel Apr.28	Machine Tools Mar.10	Refrigerators Apr.28
Fab. Struc. Steel ...Apr.7	Malleable Castings .Apr.14	Steel Castings Apr.14
Foundry Equip. Apr.14	Prices Feb.18	Steel Forgings Apr.7
Freight Cars Apr.21	Pumps Mar.31	Steel Shipments Apr.21
Furnaces, Indus. ...Mar.31	Purchasing Power ..Mar.3	Washers Apr.7
Gear Sales Apr.7	Radio, TV Mar.24	Water Heaters Mar.24

tons, an increase of 10 per cent over shipments in February. Shipments in the first quarter, 1952, totaled 762,430 tons, greater by some 18 per cent than in the corresponding period of 1951. While shipments increased, new orders for fabricated structural steel dipped slightly from February to 297,517 tons. That's 25 per cent below bookings during March, 1951.

Costs Higher . . .

The cost of living for the first time in three months inched upward in March, reports the Labor Department. Retail prices of goods and services bought by moderate-income families averaged slightly (0.1 per cent) higher in March than in February. Retail food prices, which dropped sharply in February, leveled off, while small increases in miscellaneous goods, services and rents brought the Bureau of Labor Statistics' index slightly upward. Living costs are now 10.5 per cent higher than before Korea and 1.9 per cent above a year ago, according to the index.

Appliances Lag . . .

Reflecting consumer resistance to spending for new household appliances, factory sales of standard-size household washers in March dropped 32.5 per cent below the units sold during the same month of 1951. March factory sales of the standard-size models dropped to 248,431 units, 2.9 per cent below sales in February.

March sales of ironers were off even more sharply, with 13,913 units, down 21 per cent from February and 59.9 per cent below units sold in March, 1951. Automatic tumbler dryers sold in March totaled 41,161, off 7.6 per cent from the previous month's sales and down 6.5 per cent from the 44,020 units sold in March, 1951.

Spring Decline . . .

The usual spring letdown in coal production is more severe this year. Soft coal miners dug 25.5 million tons of soft coal in the three weeks ended Apr. 19. That's 15 per cent below the year-ago output. In the week ended Apr. 19, 9,175,000 net tons were produced. That's 1,449,-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	100.5	96.5	103.5
Electric Power Distributed (million kwhr)	7,140	7,120	6,673
Bituminous Coal Output (daily av.—1000 tons)	1,529	1,362	1,771
Petroleum Production (daily av.—1000 bbl)	6,300[1]	6,365	6,174
Construction Volume (ENR—millions)	$371.1	$235.1	$274.7
Automobile, Truck Output (Ward's—units)	135,769	131,657	162,740
TRADE			
Freight Car Loadings (unit—1000 cars)	730[1]	735	825
Business Failures (Dun & Bradstreet, number)	164	188	162
Currency in Circulation (millions)[3]	$28,333	$28,436	$27,122
Dept. Store Sales (changes from year ago)[3]	−1%	+11%	+3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,554	$16,168	$16,102
Federal Gross Debt (billions)	$258.0	$257.5	$254.6
Bond Volume, NYSE (millions)	$17.0	$14.2	$17.2
Stocks Sales, NYSE (thousands of shares)	6,800	8,102	8,782
Loans and Investments (billions)[4]	$73.1	$72.9	$69.7
United States Gov't. Obligations Held (billions)[4]	$31.2	$31.0	$30.7
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	171.92	171.92	171.92
STEEL's Nonferrous Metal Price Index[6]	243.6	243.6	243.0
All Commodities[7]	111.3	111.5	114.2
All Commodities Other Than Farm and Foods[7]	113.1	113.2	116.1

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

000 net tons less coal than was dug in the same week, 1951.

Failures Soar . . .

Twice as many manufacturing companies failed in the week ended Apr. 17 as in the comparable week in 1951, says Dun & Bradstreet Inc. Mortalities of manufacturing concerns rose to 47 in the week ended Apr. 17. That's 21 more companies than reported failures in the previous week. Total business failures in the week ended Apr. 21 rose to 188; that is 37 above the total for the same week last year and equal to the casualties reported in the same week, 1950.

Power Declines . . .

Electric power production is taking its seasonal decline as the warmer spring months with longer days arrive. In the week ended Apr. 19, output totaled 7120 million kwhrs, a decline of 133 million kwhrs from the comparable week in March.

Nevertheless, electric output is greater now than it used to be. Production in the week ended Apr. 19 was 560 million kwhr above the corresponding week in 1951 and 1274 kwhr above the output in the like week in 1950.

Trends Fore and Aft . . .

Loading of revenue freight during the week ended Apr. 19 totaled 735,097 cars. That's a decline of 9.2 per cent below the same week in 1951 . . . Factory shipments of truck-trailers in February totaled 4885, slightly below the January number . . . Department store sales declined 23 per cent from last year in the week ended Apr. 19. End of Easter shopping did it . . . Bank clearings totaled $17.5 billion in the week ended Apr. 23. That's a 9 per cent gain over the comparable 1951 week . . . Loans to metalworking companies increased $55 million in the week ended Apr. 16. Metalworking firms have borrowed $996 million since Dec. 26, 1951. . . . The Federal Reserve Board's industrial production index records a production drop of 2 percentage points to 220 (1947--1949 = 100) in March. Output of durable goods fell 1 point to 282 per cent. . . . In the event of a prolonged steel industry strike, STEEL's industrial activity index will take a sharp drop of 60 to 70 per cent. Following the decline in steel production, expect freight car loadings and electric power output to take sharp drops. The rate of turnout of auto assemblies may not be retarded until four weeks later.

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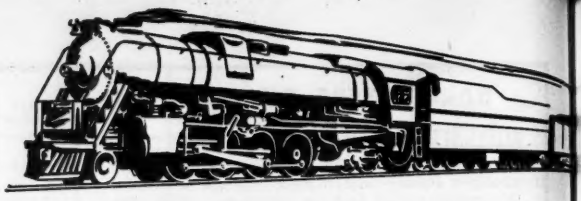

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Special Iron Rolls
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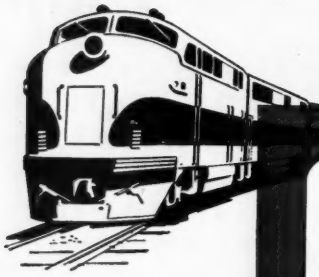
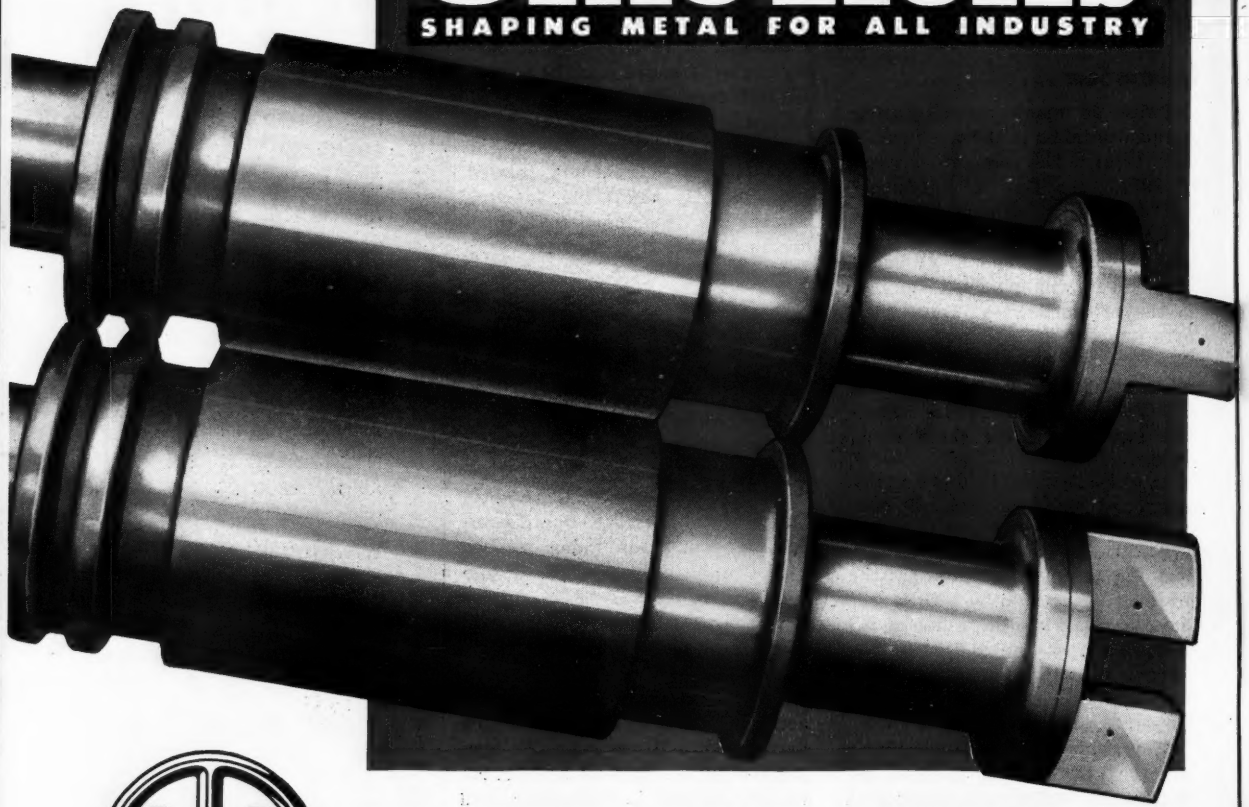
Flintuff Rolls



Ohio Rolls

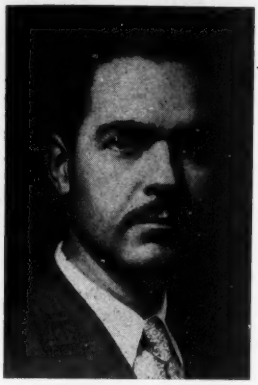
SHAPING METAL FOR ALL INDUSTRY



THE OHIO STEEL FOUNDRY CO.

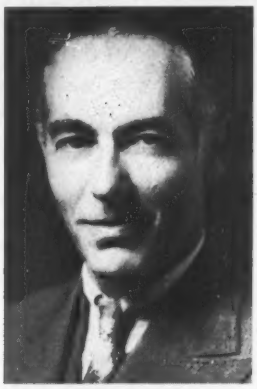
LIMA, OHIO • PLANTS AT LIMA AND SPRINGFIELD, OHIO

Men of Industry



JOHN M. DUMSER
. . . Wolverine Tube sales director

CLAUDE S. LAWSON
. . . heads U. S. Pipe & Foundry



ARTHUR P. DAVIS
. . . again heads Arma Corp.

John M. Dumser was appointed director of sales, **Wolverine Tube Division,** Calumet & Hecla Consolidated Copper Co. Inc., Detroit. He succeeds **George D. Potter,** who resigned to devote full time to the operation and sales program of Corey Steel Co., Chicago, of which he is a vice president. Mr. Dumser joined Wolverine in 1951 and has held the position of general sales manager.

Gordon M. Byrnes was elected president of **Milwaukee Forge & Machine Co.,** Milwaukee, to succeed the late **R. R. Smith. Arthur A. Buettner** was elected vice president and general manager in charge of production.

Carl S. Ablon was promoted to Ohio district manager of **Luria Bros. & Co. Inc.,** with offices in the Midland building, Cleveland. Mr. Ablon joined Luria Bros. in 1946.

Harry L. Edgcomb Jr., formerly general sales manager, was elected vice president in charge of sales, **Edgcomb Steel Corp.,** Hillside, N. J. **M. O. Kopperl,** formerly vice president, was elected executive vice president.

W. R. Warren Leisy was appointed chief chemist, **Wheatland Tube Co.,** Philadelphia. He will be in charge of research on end products and will serve as supervisor of material standards control for all Wheatland Tube products. Mr. Leisy was most recently with New Jersey Zinc Co.

Claude S. Lawson was elected president and chief executive officer, **United States Pipe & Foundry Co.,** Burlington, N. J., and **James J. Reynolds** was elected vice president. Mr. Lawson has been president of Sloss-Sheffield Steel & Iron Co. since 1948 and associated with the company since 1915. **Norman F. S. Russell** was re-elected chairman of the board. He relinquished the office of president which he has filled since resignation of **Gen. Donald Armstrong** in December.

Fred Osborne, general superintendent in charge of manufacturing, was elected president of **Sloss-Sheffield Steel & Iron Co.,** Birmingham. He succeeds **Claude S. Lawson,** now president of United States Pipe & Foundry Co.

Ward A. Wickwire Jr. was elected president of **Salem-Brosius Inc.,** Pittsburgh. He has held positions of executive vice president of the company since 1951 and vice president since 1947. As president he succeeds the late **W. A. Wickwire Sr.**

Leslie Touluse was appointed plant manager, **Chrysler Corp.'s** Amplex Plant in Detroit.

Alexander I. Stayman was elected vice president of sales, **Pittsburgh Screw & Bolt Corp.,** Pittsburgh. He has been assistant to the president since May, 1951, and associated with the company for 17 years in the sales division.

Arthur P. Davis, co-founder and president of **Arma Corp.,** Brooklyn, N. Y., subsidiary of American Bosch Corp., until retirement in 1947, has returned to serve again as its head. **Donald P. Hess,** president of the parent company, was made vice chairman of Arma.

Scott H. Patterson, New York district manager, was named Buffalo branch manager of **American Brass Co.** to succeed **Justice Lockwood,** recently named vice president in charge of company sales, with headquarters at Waterbury, Conn.

Hubert A. DesMarais was appointed general sales manager, **Pennsylvania Salt Mfg. Co.,** at Tacoma, Wash. **G. T. Collins** was elected assistant to the president of the company at Philadelphia.

Wyckoff Steel Co., Pittsburgh, appointed **D. G. Dodds** as vice president-finance and secretary, and **Norman W. Smith** as treasurer and assistant secretary.

Clifford C. McAleenan was appointed vice president in charge of sales, **Capewell Mfg. Co.,** Hartford, Conn. Mr. McAleenan joined Capewell in 1950 when that company acquired V-Mac Industries Inc., where he was sales manager and secretary-treasurer.

Edwin H. Keiper was made chief engineer, **Pennsylvania Crusher Co.,** Philadelphia, subsidiary of Bath Iron Works Corp. He joined the company in 1919. In 1939 he

was appointed chief design engineer, and in 1949 became chief service engineer.

F. T. Whited Jr. and **R. T. Moore** were elected directors of **Olin Industries Inc.**, East Alton, Ill.

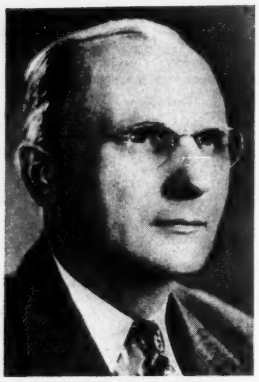
Russell E. Poster was appointed abrasive sales engineer for **Clover Mfg. Co.**, Norwalk, Conn.

Sundstrand Machine Tool Co., Rockford, Ill., elected **Gilmore J. Landstrom** vice president and treasurer, and **Burrell A. Gustafson**, vice president in charge of the machine tool division.

B. B. Button was appointed general sales manager, **Diversey Corp.**, Chicago. **C. R. Reid** was made assistant to the vice president in charge of sales; **R. J. Keller**, credit manager; and **D. V. Hannibal**, manager of the technical development department.

R. N. Yates resigns June 30 as vice president and general manager, **Erie Foundry Co.**, Erie, Pa., to engage in business for himself.

Arthur R. Lytle was appointed director of research, **Union Carbide & Carbon Research Laboratories Inc.**, Niagara Falls, N. Y. **Walter Crafts** becomes associate director of research and **David Swan**, assistant director of research. These laboratories are the primary metallurgical laboratories for Union Carbide & Carbon Corp., New York, and conduct research for Electro Metallurgical Co., Haynes Stellite Co., Linde Air Products Co., and other divisions of the corporation. Mr. Lytle moves from Niagara Falls to New York.



GEORGE J. SCHAD
. . . new V. P. at Tinnerman

ROBERT C. OVERSTREET
. . . new V. P. at Tinnerman

George J. Schad and **Robert C. Overstreet** were elected vice presidents of **Tinnerman Products Inc.**, Cleveland. They continue in their respective positions of treasurer and secretary.

A. Milne & Co. appointed **H. S. Hoyt Jr.** as manager of its Chicago branch. He succeeds **Harry R. Adams**, retired.

O. B. Wilson was made field sales manager, industrial division, **Minneapolis-Honeywell Regulator Co.**, Minneapolis. He succeeds **William H. Steinkamp**, recently made general sales manager of the division.

J. C. Baseheart was appointed general sales manager, engine division, **Buda Co.**, Harvey, Ill.

Paul C. Nicholson Jr. was elected president and general manager, **Nicholson File Co.**, Providence, R. I. He replaces his father, **Paul C. Nicholson**, who becomes chairof the board. The new president was elected assistant secretary in 1942, a director in 1947, and secretary in 1948.

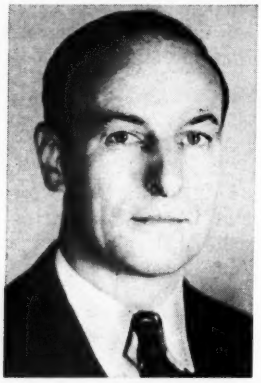
Otis R. Carpenter, since 1947 director of the Barberton, O., Works Control Laboratory of **Babcock & Wilcox Co.**, New York, was appointed an executive assistant of the company.

J. T. Cataldo was appointed assistant general manager, **International Rectifier Corp.**, El Segundo, Calif.

Stephen M. Martin was appointed mechanical engineer, **Storts Welding Co.**, Meriden, Conn. Since 1939 he has been chief engineer of United Chromium Inc.

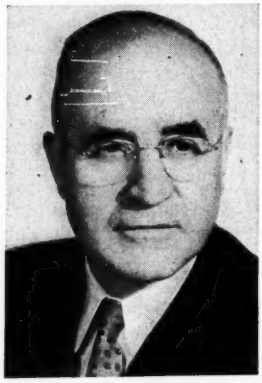
David L. Henry joined the staff of **Metal Hydrides Inc.** as an assistant research chemist.

L. G. Graper was elected a vice president of **Lone Star Steel Co.**, Dallas. He was formerly technical adviser on steel for the company's new steel plant and pipe mill. He

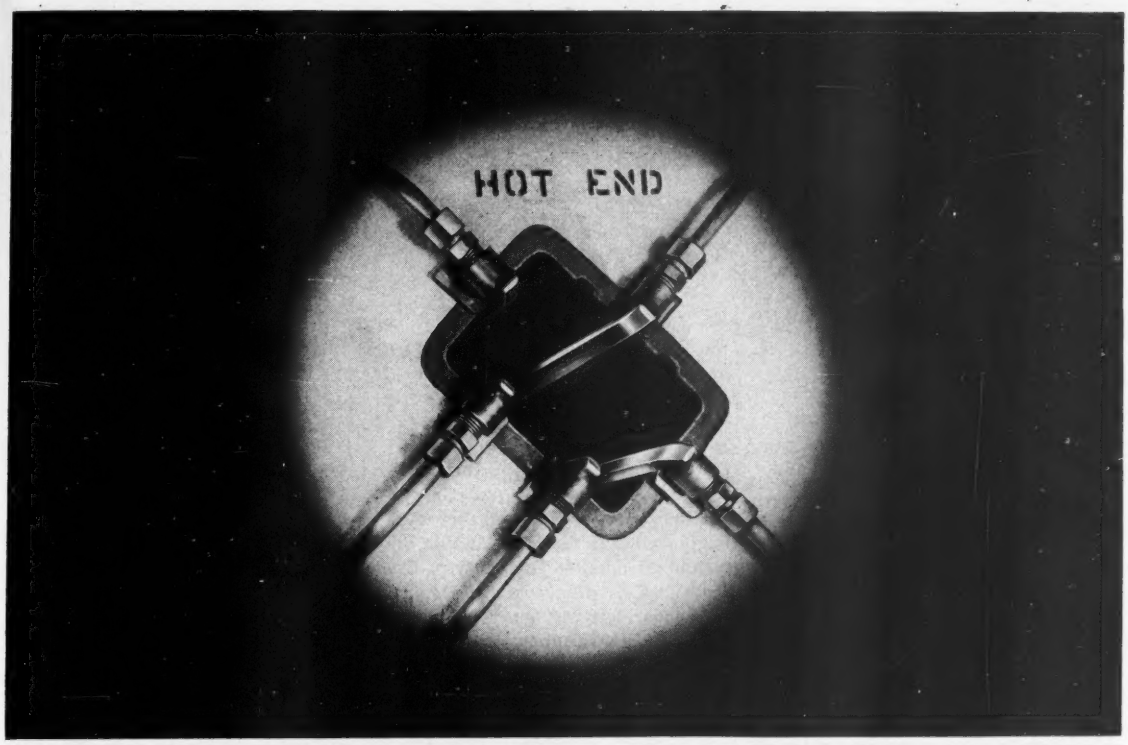


ARTHUR R. LYTLE
. . . research dir. at Union Carbide

PAUL C. NICHOLSON JR.
. . . president of Nicholson File



L. G. GRAPER
. . . new V. P. of Lone Star Steel



The Superior Tube That Keeps Its Temper In A Hot Spot

Producing tubing and tubular parts that stand up well even when the heat's on is a Superior specialty.

One of these parts is shown above. It is a guide rail for a TOCCO† induction hardening furnace, manufactured by The Ohio Crankshaft Co., a Superior customer.

This simple tube has to be tough. Constantly exposed to high heat, it must retain its temper, stay hard. Continually abraded by the scrubbing action of the 25 pound hot-rolled steel slugs that ride along it, it must require infrequent replacement. In addition it must not crack when brazed, or develop cracks in use.

Reading this list of requirements would suggest that the guide rail must necessarily be a brute-strong, thick-walled, heavy-weight. It isn't—it is a ⅜" square Inconel* tube with a wall only .065" thick. It is another example of fine, small tubing that does a big job well.

Producing it presented a problem—but just the type of problem we like to meet and can almost always solve. We have the right combination of engineering, research and production facilities that makes it easy for us to work closely with our customers' designers and engineers, and to produce the tubing required to fit the most exacting specifications.

If you use small tubing and have a problem it might be well to check with us. We can probably help and will be glad to do so. Write Superior Tube Company, 2005 Germantown Ave., Norristown, Pennsylvania.

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All analyses .010" to ⅝" O.D.
Certain analyses (.035" max. wall) up to 1⅜" O.D.

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ROUND AND SHAPED TUBING

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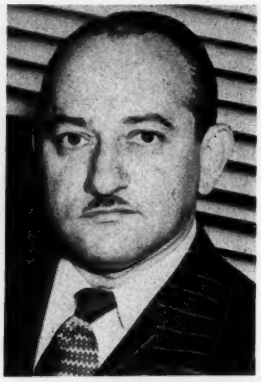
†Reg. U.S. Trademark—The Ohio Crankshaft Co.

RICHARD COUCH JR.
. . . A. Harold Frauenthal Inc. sales mgr.

O. S. CARLISS
. . . Yale & Towne engineering post



SAMUEL ZOLIN
. . . V. P.-treasurer, Cooper Alloy

is now in charge of research and technical advancement.

Richard Couch Jr. was appointed sales manager, **A. Harold Frauenthal Inc.**, Muskegon, Mich. He has been process engineer with the Detroit Tank Division of Ford Motor Co.

Paul J. Krause was appointed district sales representative for **U. S. Steel Supply Division**, Toledo, O., U. S. Steel Co. He succeeds **George Fedurek**, resigned. **Paul F. Dorfmeyer** was appointed resident salesman, located at Findlay, O. **Donald W. Winkel** is a new Toledo salesman.

Frank A. Brede joined **Graton & Knight Co.** as chief engineer, transmission and development, in the research and development department at Worcester, Mass.

B. J. A. Sturrock was appointed division tubular manager, **National Supply Co. Ltd.**, Canadian division of National Supply Co. He will operate out of division headquarters at Calgary, Alta.

O. S. Carliss was appointed director of engineering, and **George F. Quayle** as assistant director of engineering of the Philadelphia division of **Yale & Towne Mfg. Co.** Mr. Carliss succeeds **Charles S. Schroeder**, and Mr. Quayle replaces **Frank A. Vossenberg**, who were appointed respectively director and assistant director of the newly created company-wide research and development division.

Elected to newly created positions of executive vice presidents at **Rockwell Mfg. Co.**, Milwaukee, are **L. A. Dixon**, who heads the valve and meter division, and **J. E. Ashman**, who heads the power tool division. **L. A. Dixon Jr.** was advanced from assistant vice president to vice president.

Anthony J. Allen joined **Wall Colmonoy Corp.** as eastern sales manager with headquarters in New York.

Beaver Tool & Engineering Corp., Royal Oak, Mich., appointed **W. E. Vogel** as sales manager. He has served the company several years as chief engineer.

Samuel Zolin was elected vice president and treasurer, **Cooper Alloy Foundry Co.**, Hillside, N. J. He has been with the company 25 years.

John T. Brown was elected executive vice president, **J. I. Case Co.**, Racine, Wis. He joined the company in 1948 as vice president in charge of manufacturing. He had resigned as vice president-manufacturing of Chain Belt Co., with which he had been associated since 1925.

Boyer-Campbell Co., Detroit, elected **William P. Goudie** president and chairman of the board; **John F. Phillips**, executive vice president-sales; **Robert G. Campbell**, vice president, secretary and general manager; **James McMillan**, vice president and treasurer; **F. W. Alcron**, assistant secretary; **Harold McGuffin**, assistant treasurer; **Kenneth McKetchie**, assistant general manager; and **Clair Davis**, sales manager.

Robert E. Etherton was appointed Chicago district manager of **Peninsular Grinding Wheel Sales Corp.**

OBITUARIES . . .

George C. McClure, 47, executive vice president, **Hercules Steel Products Corp.**, Galion, O., died Apr. 26 of a heart attack.

Russell L. Lilley, 54, supervisor of production planning, South Works, **American Steel & Wire Co.**, at Worcester, Mass., died Apr. 21.

N. W. Westbrook, 58, purchasing agent, **Tennessee Products & Chemical Corp.'s** Southern Ferro Alloys Division, Chattanooga, Tenn., died Apr. 9 of a heart attack. He served the division for 35 years.

Walter H. Bratten, 55, manager, Canadian sales division, **United States Steel Export Co.**, New York, died Apr. 22 in Winnipeg while on a business trip.

C. Laurence Warwick, 63, executive secretary, **American Society for Testing Materials**, Philadelphia, and its administrative head since 1919, died Apr. 23 while presiding at a dinner in honor of the society's retiring treasurer.

Ralph S. Schrandt, 46, factory manager, **Ben-Hur Mfg. Co.**, Milwaukee, died Apr. 25.

William E. Burns, 73, retired president, **Michigan Malleable Iron Co.**, Detroit, died Apr. 24.

...another tribute to LEVINSON workmanship

THIS important furnace installation, made for a leading eastern steel mill, was designed and engineered by Loftus Engineering Co., of Pittsburgh, world-famous builders of industrial furnaces.

In this particular job, Levinson co-operated by fabricating structural steel *as specified* . . . and delivering *on time*. This is just one of many examples of how Levinson helps expedite today's vital construction projects. And, as always, *accurate fabrication* is the keynote . . . saving time on the job and minimizing erection costs.

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December 19, 1951

Re: Our Contract 11-3308

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Pittsburgh, Pa.

Gentlemen:

On this particular order, we know it will interest you to know that our contractors report that in their years of experience erecting furnace binding, this was the first they had ever put together without once using a burning torch. The steel binding is now practically all installed.

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Production AND Engineering
NEWS AT A GLANCE

MORE NICKEL PRODUCTION—Recovery of millions of tons of nickel-copper ores, previously considered unworkable, is now economically feasible because of improved mining methods, including blasthole and caving processes. These developments are part of a program launched by International Nickel Co. to increase underground production as a replacement for depleted open pit tonnage. Conversion to all-underground mining will be completed within the next two years. The underground mines will then have an annual hoisting capacity of 13 million tons. Total ore mined in 1951 from both underground and surface operations was 11,800,000 tons. Production from underground was 7,780,000 tons.

ON MAGNESIUM FORMABILITY—Magnesium can be formed by many of the same techniques used to fabricate other metals. The principal difference is that magnesium alloys are usually formed at elevated temperatures. At 450 to 700°F magnesium can be more severely worked than most other metals at room temperature. Drawability, for instance, improves from a possible reduction of about 25 per cent at room temperatures to a maximum of about 70 per cent at 450°F and 73 per cent at 550° for various magnesium alloys. p. 98

SMOKE CONTROL PLUS—U. S. Steel's three new sintering plants in the Pittsburgh district recover about a million tons of ore per year from blast furnace dust, in addition to reducing air pollution. Dust and smoke control at one of the plants is improved by two gas washers and electrostatic precipitators for cleaning blast furnace gas. The cleaned gas is the principal fuel in five new boilers equipped with collectors to cut smoke from the boiler stacks.

KEEP CYLINDERS MOVING—Oxygen and acetylene prices, Linde Air Products Co. points out, are based on rapid turnover of cylinders. When cylinders are held overtime, the gas producer needs more of the containers. So his costs go up. And his prices rise. To speed up cylinder turnover demurrage is charged on all cylinders held over 30 days. This is not intended as a source of income for the gas producer. Everyone concerned would be happier if all cylinders were returned to the supplier as soon as they are empty.

NEEDED: CORROSION CONTROL—Corrosion in oil wells producing hydrogen sulphide is costing the oil companies millions of dollars annually. The National Association of Corrosion Engineers reports that of the 8215 sour-crude wells studied, 3618, or about 44 per cent, were economically affected by corrosion. Costs of corrosion ranged from an average of $270 per well per year in the West Texas-New Mexico area to $2000 per well per year in the Kansas area. Corrosion sometimes may progress rapidly; tubing leaks or rod breaks may occur on an average of one every 30 days; pumps may have to be pulled frequently, either because of corrosion of the pump itself or because of corrosion products from the pipe accumulating in the pump.

ATMOSPHERES AND BRAZES—Credit for a large part of the progress made in furnace brazing goes to the development of protective atmospheres. The question of what controlled atmosphere to use in joining a given metal involves some fairly complex factors. Base metals, brazing material and brickwork as well as other portions of the furnace exposed to the heat all affect and are affected by the atmosphere. The atmosphere must be capable of arriving at some state of equilibrium with these elements and still be able to reduce any oxides present in the brazing alloy or on the base metal. p. 102

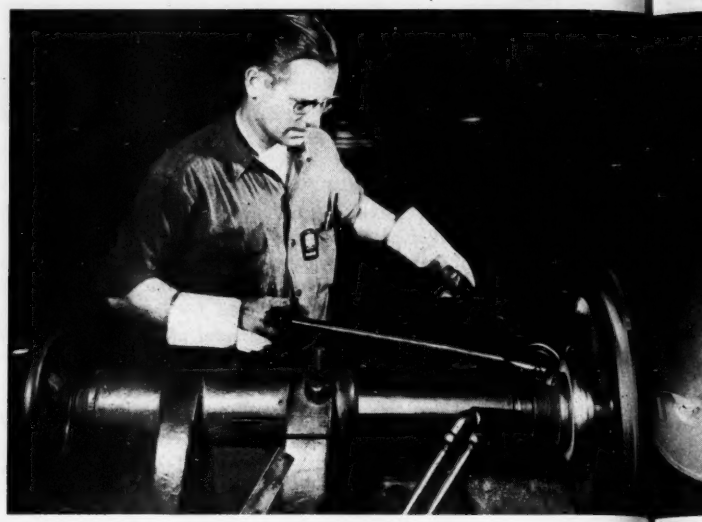
TAKES ANY TRACKS—A new type diesel locomotive built by General Motors to Army Transportation Corps specifications, can run on varying gage tracks from U. S. standard up to the widest in use. The change is made by a simple mechanical adjustment of wheels on the axles. Power plant is a 16-cylinder, two-cycle diesel rated at 1600 hp, giving top speed of 77 mph. Design permits operation in weather extremes of minus 40°F to plus 125, allows use of 40 cetane fuel oil or lower.

PLANNED MAINTENANCE PAYS—Mechanical and electrical break-down delays are reduced 44 per cent and cost per ton cut 25 per cent as a result of planned maintenance at J&L's blooming mills. Here are some of the factors involved in achieving this result: Physical and metallurgical design, regularly scheduled repair times, lubrication, investigation of equipment failures, equipment performance data files. In any continuous operation industry, the most costly part of a breakdown is not the actual repair but the inconvenience suffered by all subsequent production operations. p. 106

OUT OF THE LABORATORIES—Analysis of petroleum products in one-tenth the time now required is said to be possible with a combination of electronic computer and mass spectrometer. The combined instruments analyze and record chemical compositions . . . Problems of boiling metals at temperatures as high as 5000°F at pressures as low as one hundred thousandth of an atmosphere are reported solved in a commercial method for vacuum casting gas-free metals.

Metalworking Outlook—p. 61 Market Outlook—p. 179

Aircraft industry uses magnesium for large components. An example is this arc-welded fuselage tail boom



Magnesium can be severely spun at elevated temperatures. Gas torches trained on mandrels, sheet hold temperature

MAGNESIUM FABRICATION—

Lower Finished Costs

While initial cost of the metal may be high, saving accruing from lower fabrication costs results in a lower finished cost if correct techniques are used

MAGNESIUM alloys are worked in much the same manner as other metals. Main difference is that many forming operations are carried out at elevated temperatures. Alloys have a close-packed hexagonal crystal form that limits deformations at room temperature. As the temperature is raised, allowable deformation increases rapidly. At temperatures of 450 to 700°F (230 to 370°C) the metal may be more severely worked than most other metals at room temperature.

Just about all of the common processes used in fabricating aluminum alloys can also be used with magnesium alloys; some without modification, others with equipment and techniques adapted to magnesium. Modifications often result in advantages which reduce fabricating cost below that for other metals. Some deep draws can be made with magnesium in one hot operation on one die, whereas the same part drawn cold in aluminum may require two or more operations on separate dies with intervening anneals.

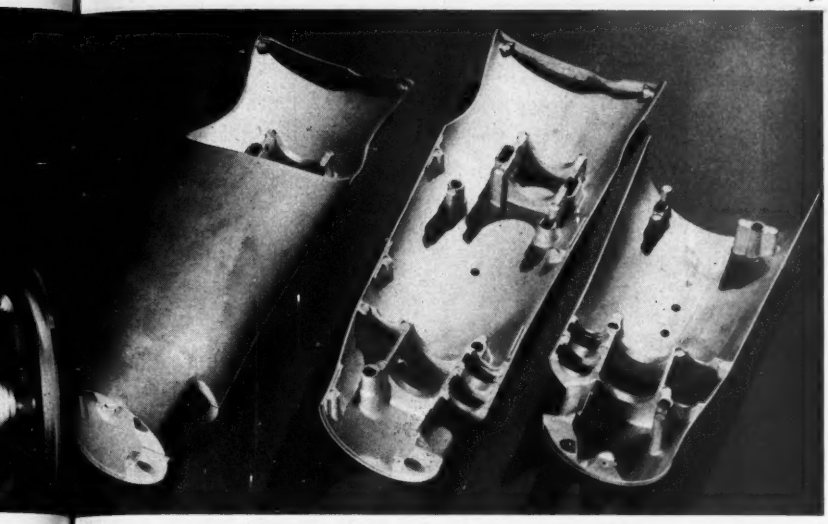
If extensive machining is required fast cutting magnesium results in a lower overall cost despite higher material cost. Shops accustomed to hot forming methods regard magnesium forming as less troublesome than other metal forming in some respects.

Cutting—Magnesium alloy sheet is sheared, blanked and punched in about the same manner as other metals. On hard rolled sheet thicker than 0.064-inch and annealed sheet thicker than 0.125-inch, however, sheared edge tends to be rough and flaky. For desired smoothness, it may be necessary to preheat plate for shearing or to remove about 1/32 to 1/16-inch in a second cut shaving away the flaky material.

Clearance between blades should be as small as practical without scoring. In mills of Dow Chemical Co. shear blades are set close enough to cut tissue paper. Upper blade should have a rake angle of not over 30 degrees. Lower blade should have a square edge. Material thicker than ½-inch should be sawed instead of sheared.

Cutting torches are not suitable for magnesium. Routing and fly-cutting take advantage of the easy machinability of magnesium and are very satisfactory. Conventional machines have single flute router bits. Flutes should be smooth and polished and may be either straight or with a helix angle of 15 degrees. Bits are generally ¼-inch or 5/16-inch in diameter, are driven at 10,000 rpm. Routing may be done dry, if bit is kept sharp and free of chips. A low viscosity, high flash point mineral oil is suggested to act both as a coolant and a lubricant.

Circle shears and nibblers produce a rough flaky fracture on magnesium. Circle shears employing an inclined arrangement of



Many intricate automobile parts are being economically produced by die casting in the automotive industry. Steering column jacket is typical

shafts and having cutters designed for magnesium cut as cleanly as a blanking die.

Blanking and Punching — For blanking and punching, dies and material are usually cold. Punching hot sheet results in binding of the hot material to the cold punch as it cools. Sheared-in dies give smoothest edges. Punch or die is made of a softer material so it can be sheared into its mating die. If both dies are machined, clearance should be a maximum of 3 per cent to 5 per cent of the material thickness.

Magnesium sheet and extrusions are easily cut on circular saws, band saws, and hack saws. Cutting pressure is low and allows deeper cuts per tooth to be taken than with other metals. Pitch and set are greater than for other metals. Sheet material or relatively thin extrusions require band saw blades straight or raker set. Pitch should be four to six teeth per inch for fast work, eight to ten teeth per inch for a relatively smooth edge. Thick plate and extrusions need a raker set blade with a pitch of four to six teeth per inch. Circular saw blade teeth can be either straight mill type or the "triple-chip" type. Blade sides of circle saws should be hollow ground. Peripheral speed should be about 2000 fpm.

Machining—For machining magnesium, tools are ground with sharper cutting angles. To reduce possibility of igniting chips from thin cuts taken at high speeds, a coolant is recommended. Coolants also reduce distortion from excessive generation of heat. Straight mineral oil coolants should be used having a flash point above 275°F. Water or oil-water emulsions should never be used as a magnesium coolant.

Forming — Magnesium can be formed in press brakes, roll benders, forming rolls, drop hammers, and by spinning, by shrinking, by stretch forming, by rubber hydropress forming, and by deep drawing and pressing. Mild cold forming can be done. More severe forming jobs require elevated temperatures.

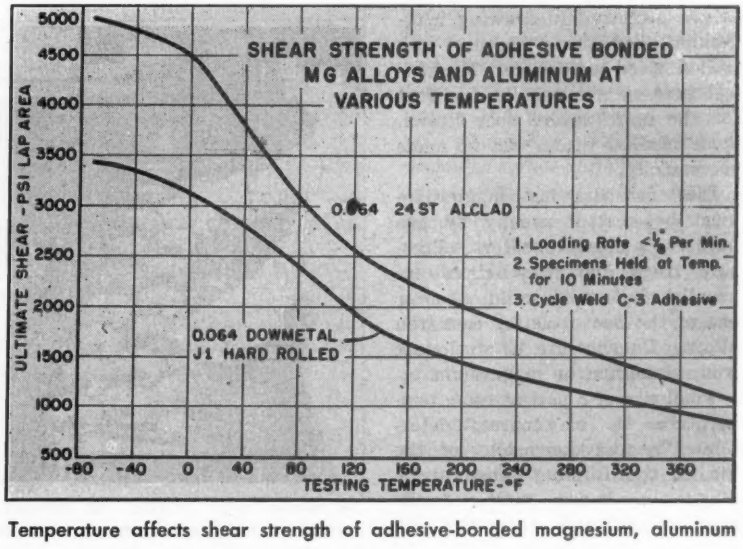
SUGGESTED MAXIMUM FORMING TEMPERATURE

Alloy	Sheet Temperature	Time
FS1-0	550° F	1 Hr
FS1-H24	325° F	1 Hr
M-0	700° F	1 Hr
	Extrusions	
J1-F	550° F	1 Hr
FS1-F	550° F	1 Hr
M-F	700° F	1 Hr
01-F	550° F	½ Hr
01-T5	380° F	1 Hr
ZK60A-F	550° F	½ Hr
ZK60A-T5	400° F	½ Hr

Bending Sheet, Extrusions — Magnesium sheet alloys may be bent in leaf brakes or press brakes, but dies can be more easily heated on the latter and are most commonly used. Thermostatically controlled electric strip heaters, clamped to the die sides bring dies to forming temperatures.

Minimum die radii for 90-degree bends in FS1-0 annealed magnesium sheet vary from about six times the sheet thickness at room temperature to about two times at 500°F. Minimum die radii for 90-degree bends in FS1-H24 hard rolled sheet range from 8t at room temperature to 4½t at 325°F. Smaller die radii can be used on hard rolled sheet at higher temperatures, with controlled preheating and forming times so that minimum mechanical property specifications are maintained.

Forming Extrusions—Bars and extrusions can be bent on standard



Temperature affects shear strength of adhesive-bonded magnesium, aluminum

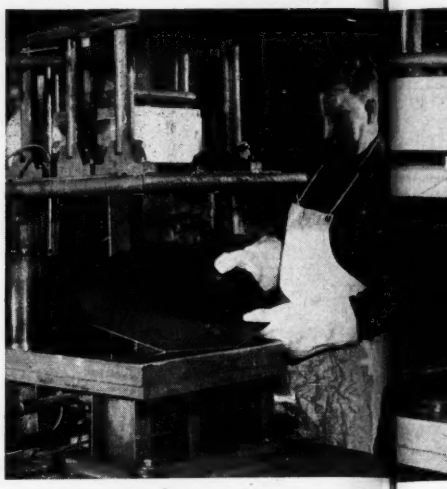
TABLE I
DIE TEMPERATURE-DIMENSION FACTORS

Die Working Temp. °F	Multiplying Factor — Aluminum	Steel or Cast Iron
Room	1.0000	1.0000
200°	1.0005	1.0009
300°	1.0008	1.0017
400°	1.0012	1.0025
500°	1.0016	1.0032
600°	1.0020	1.0040

NOTE: Dimension of magnesium part multiplied by die factor gives room temperature die dimension. (Based on tests by Dow Chemical Co.)

TABLE II
STRENGTH PROPERTIES OF INERT-GAS METAL-ARC-WELDED BUTT JOINTS

Material	Welding Rod	Tensile Strength psi	Elongation Per cent in 2 In.	Joint Efficiency Per cent
		Sheet and Plate		
M-0	M	20,000	2.0	60
M-H24	M	22,000	1.5	60
FS1-0	J	36,000	12.0	97
FS1-H24	J	37,000	10.0	86
		Extrusions		
M	M	20,000	2.0	55
FS1	J	35,000	12.0	92
J1	J	40,000	8.0	91
01	C	42,000	4.0	91
		Castings		
H-T6	H	28,000	3.0	70
C-T6	C	28,000	3.0	70



Magnesium blank, coated wih graphite is ready for deep drawing operation

equipment: Angle rolls, stretch formers, tangent benders, press dies. Parts are preheated in ovens. Dies are used both hot and cold. Whether heat must be used is determined by the severity of the bend, the shape, size and alloy of magnesium being used. Torch heating and hand forming are often used for a small number of parts. Dies and backup blocks may be of wood, magnesium, aluminum, cast iron, or steel, depending on temperature and quantity requirements.

Standard machines bend magnesium tubing. Difficult bends must be made with bending tools heated, and a mandrel or a filler material to prevent collapse of the tube.

Deep Drawing—Hydraulic presses are preferred in drawing magnesium alloy parts because controlled speed is possible. Mechanical presses are usually too fast for the more severe deep draws. Some shallow draws can be made successfully.

Dies for drawing magnesium must be heated, usually by gas burners or electric heaters. Pressure rings and draw rings are usually made from mild steel or one of the heat-resisting cast iron alloys. Punches can be steel, cast iron, aluminum or magnesium.

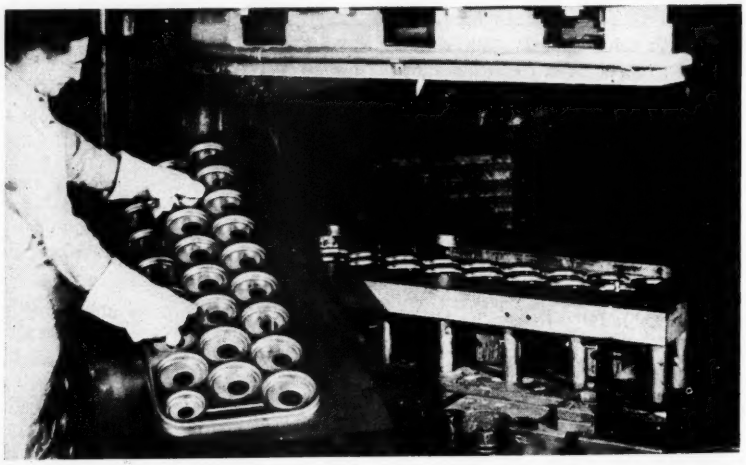
Final size of a part at room temperature is, of course, determined by the dimensions of the die at the forming temperature. Magnesium has a greater coefficient of thermal expansion and contraction than steel or other die materials. Any change in the forming temperature on a given die of another metal changes room temperature dimension of the formed part.

Where crowned parts are formed in hot mating dies, amount of crown can be changed by creating differential temperatures between center portion of die and outside surfaces. Hotter outside portion of part shrinks most creating more crown. Table I gives values of die temperature-dimension factors as determined experimentally by Dow.

Female die entering radii should be from four to seven times sheet thickness for maximum drawability. Other radii can be used if required on the finished part. Clearance between punch and die is a function of draw depth.

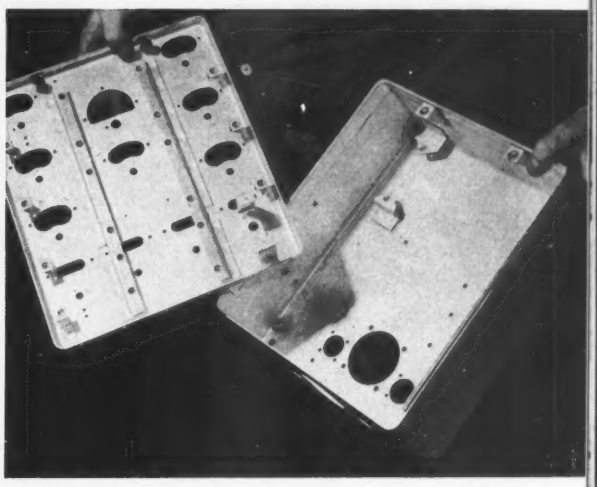
Heating Dies—Gas heated dies are most commonly used because heating elements can be most easily adapted to irregular shapes. Simple burners can be made by bending ¾ or 1-inch pipe to a contour which allows them to be located centrally to the female die and pressure plate surfaces.

Electric strip or rod heaters are also used on dies where contours permit fastening in position to give even heat distribution. Preheating of blanks in ovens or by contact platen heaters speeds forming operations by eliminating waiting for dies to transfer heat



A waffle grid stiffener for aircraft wing is removed from a mechanical press of the type commonly used in shops serving the automotive industry

Drawn box is taken from die after drawing operation. Flashing around edge will be trimmed in later operation



Finished part—an electronic junction box. Graphite has been removed, edge trimmed, other assemblies added

to the blanks. Blanks have been heated in contact heaters to 600°F in less than 10 seconds.

Die Lubrication — Satisfactory high temperature lubricant for drawing magnesium is colloidal graphite. Material, suspended in a low boiling point naphtha or alcohol, is sprayed onto blanks. Recently, Dow fabrication plants have applied it with rolls reducing application time considerably. Die surfaces should be lubricated occasionally by buffing on a mixture of 20 per cent graphite in tallow.

Lubricants should be removed as soon as possible in damp weather because the graphite may cause galvanic corrosion on the magnesium. Colloidal graphite is removed from magnesium chemically.

One Operation Draw—Great majority of parts can be drawn from magnesium in one operation at elevated temperatures. Drawability* increases from a possible reduction of about 25 per cent at room temperatures to a maximum for FS1-0 of about 70 per cent at 450°F and 73 per cent for M-0 at 550°F. Successive dies can be used to obtain deeper draws.

* Formula for drawability: $\frac{D-d}{D} \times 100$

D equals original blank diameter
d equals final blank diameter

Drawing speeds depend on the difficulty encountered in forming the part. On mechanical presses, simple draws have been made at platen speeds of 40 to 60 fpm. Some difficult parts have required hydraulic presses with speeds as slow as 1 foot per minute or less. Usual speed of 2 to 4 fpm obtained on hydraulic presses takes care of most drawing operations.

Rubber Forming—Shallow parts, such as aircraft ribs, spars, and fairings, can be formed at elevated temperatures by the Guerin process. A confined rubber pad takes the place of the female die and forces the magnesium to conform to the male block. Pressures are in the neighborhood of 1000 psi. Rubber is compounded especially for hot forming.

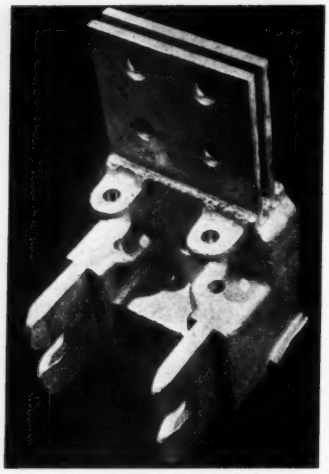
Other Forming Methods—Drop hammers are used by several companies to form magnesium alloys at elevated temperatures. Dies are usually Kirksite for high temperatures. Punches for lower temperature forming are lead. Blanks are preheated in separate ovens or platen heaters.

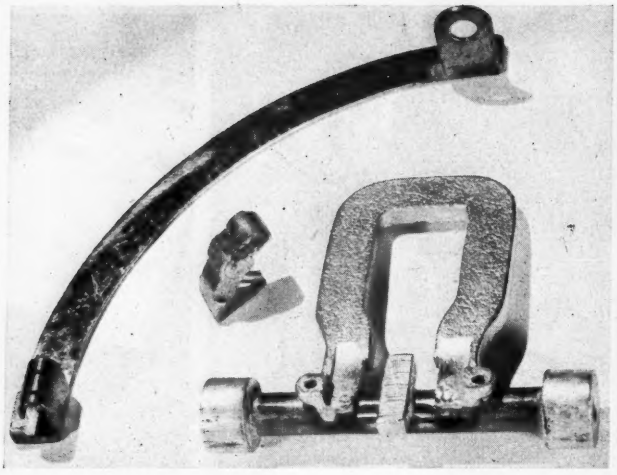
Stretch forming of soft magnesium alloy sheet is practical, at room and elevated temperatures. Hard rolled sheet is usually

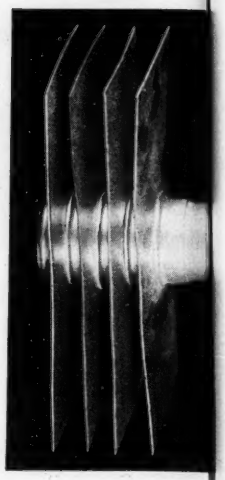
(*Please turn to Page* 118)

EXTRUSION FORMABILITY			
ALLOY*	TYP. BEND RAD. ROOM TEMP.	SUGGESTED LIMITS	
		TIME & TEMP.	TYP. BEND RAD.
J1-F	1.9 t	1 HR. @ 550°F	1 t
O1-F	2.4 t	½ HR. @ 550°F	.7 t
FS1-F	2.4 t	1 HR. @ 550°F	1.5 t
M-F	4.8 t	1 HR. @ 700°F	2 t
O1-T5	8.3 t	1 HR. @ 380°F	1.7 t
ZK60A-F	12 t	½ HR. @ 550°F	2 t
ZK60A-T5	12 t	½ HR. @ 400°F	6.6 t
*0.090"x 0.875" Extruded Flat Strip			

Suggested time and temperature limits for forming magnesium extrusions







At left, copper assembly silver brazed in lean exogas. Photo in center shows examples of copper parts silver brazed in exogas. Right photo shows low carbon steel tubing and sheet copper brazed in exogas atmosphere

FURNACE BRAZING: Atmospheres Set the Pace

Developments in protective atmosphere furnaces widen the application of brazing techniques to practically all metals. Biggest advances are in controlled atmospheres

By SAMUEL DAMON
Materials Engineering Department
Westinghouse Electric Corp.
Pittsburgh

ATMOSPHERES available today are largely responsible for the greatly increased application of furnace brazing techniques in mass production fabricating.

Role of the atmosphere in the mechanism of joining metals by brazing is complex. Base metals involved, brazing material and brickwork, as well as other portions of the furnace exposed to the heat have their effect on and are affected by the atmosphere. The atmosphere must be capable of arriving at some state of equilibrium with these elements. At the same time, the atmosphere must have the power to reduce any oxides which might be present in the brazing alloy or on the critical surfaces of the base metal.

Many Atmospheres — First employed in copper brazing was hydrogen or, very often, dissociated ammonia. From this stems the practice of referring to copper brazing as hydrogen brazing. Reducing power of this atmosphere is excellent; as a result, clean up of oxides is rapid so that bright brazing on ordinary steel parts is readily obtained. At the same time, flow of copper is good, with penetration of the joints being satisfactory. However, this atmosphere is comparatively expensive, and the development of combusted gas atmospheres such as exogas atmosphere is a welcome one.

Exogas atmosphere is generated by passing a metered mixture of hydrocarbon gas and air into a retort for reaction. The mixture of air and gas is such that the reaction is exothermic and the heat liberated is sufficient to continue it. With natural gas, the ratio can be varied between 5:1 and 9.5:1 to produce, with the former, a gas high enough in reducing power to bright braze steel and, with the latter, a gas containing only nitrogen, carbon dioxide and water vapor.

At ratios above 9.5:1, excess oxygen would be present in this gas. The gas mixture after combustion in the retort is passed through a condenser and water separator so the dew point of the gas going to the furnace is approximately room temperature.

CO_2 Scrubbed Out—Monogas atmosphere is formed by generating exogas atmosphere and then scrubbing it free of CO_2 and drying to a $-60°$ C ($-76°$ F) dew point in an absorption type dryer. By varying the ratio of the ingoing gases from lean to rich, the composition can be changed so that for lean gas the total combustibles (CO and H_2) can be held between zero and 11 per cent as desired; for medium rich gas, the combustibles can be controlled at desired values between 11 per cent and 23 per cent; and for rich gas, values can be obtained in the range between 23 per cent and 35 per cent.

In generating endogas atmosphere a ratio of gas is introduced into the retort so that combustion and reaction of the gases cannot take place unless external heat is added. Within the heated, catalyst-filled retort this rich gas-air mixture is reformed and emerges as an atmosphere containing approximately 20 per cent CO, 40 per cent H_2, the remainder nitrogen, with a small percentage of

methane and dew point of −15° C (+5° F). This is essentially a carburizing atmosphere. An atmosphere containing nitrogen and hydrogen in ratios other than those obtained in the dissociation of ammonia is obtained by combusting dissociated ammonia with various percentages of air. The hydrogen content of this atmosphere can range from 1 per cent to 20 per cent as desired and is dependent on the ratio of air to ammogas atmosphere entering the retort.

Requirements for Specific Metals—Choice of an atmosphere is dictated by the surface effects it produces on the metal or metals in question, remembering of course, that the type of furnace employed also affects the atmosphere's composition. To braze oxygen-bearing copper would require the use of a combusted gas such as exogas atmosphere, of a hydrogen content in the neighborhood of 0.5 per cent. This is obtained by regulating the gas-air mixture entering the generator to the proper ratio.

If the hydrogen content of the gas entering the furnace rises above 1 per cent, embrittlement of the copper will result with its damaging effect upon the physical properties of the copper. On the other hand, if the hydrogen content should drop below 0.2 per cent, oxidation of the copper would result. However, in brazing deoxidized or oxygen-free copper, restriction of the percentage of hydrogen permitted is not necessary.

Either lean monogas or lean combusted ammogas with the same control of per cent combustibles could be employed in the brazing of oxygen-bearing copper but would not be the atmospheres of choice from an economic standpoint.

Watch Oxygen—Another consideration is involved in those applications where careful control of temperature is necessary. An instance of this would be the brazing and simultaneous hardening of a precipitation hardening alloy such as Cupaloy, a Westinghouse copper alloy containing small percentages of chromium and silver. Aging treatment for this material requires 10 hours at 450° C (840° F). A compromise can be made as to the final hardness acceptable, if this material is to be brazed. A temperature in the neighborhood of 700° C (1290° F) would be required for the brazing operation, and the parts would be held the minimum time compatible with an acceptable braze. Such treatment would give acceptable hardening in this alloy and would combine this with the brazing operation. However, the success of such a practice would depend upon close control of the treating temperature such as is possible with a furnace since excessive time at temperature or excessively high temperatures would result in over-aging and softening the alloy.

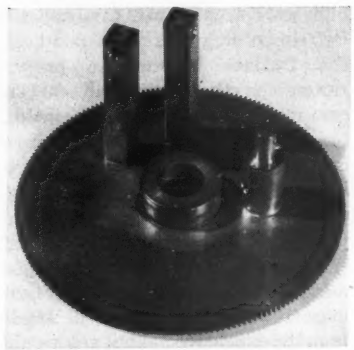
During this treatment, a lean exogas atmosphere could be employed to prevent oxidation of the Cupaloy. The solution treatment of this alloy is carried out at a much higher temperature. To prevent subsurface oxidation of this precipitation hardening alloy, it is necessary to employ a protective exogas atmosphere.

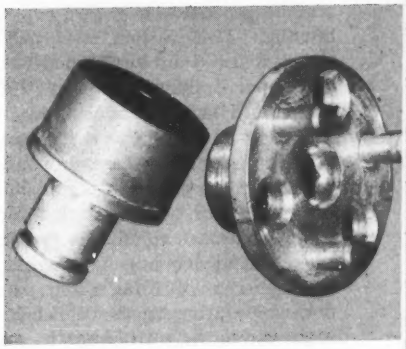
Brazing of brasses and bronzes in controlled atmosphere furnaces is carried out commercially with fluxes to ensure wetting by the brazing alloys. Reason for this is that, with the atmosphere and furnaces such as ordinarily employed in silver brazing, the contamination effect of zinc and cadmium oxides cannot be overcome by the atmosphere alone. However, use of an atmosphere will prevent oxidation of the base metal and, in addition, will protect the other metals which might be a part of the assembly.

Nickel in Hydrogen — Furnace brazing of nickel and its alloys is most commonly carried out in hydrogen or ammogas atmospheres. Ordinarily, copper is the brazing material employed. Special requirements of fit and placement of brazing material made necessary by the high solubility of nickel in copper must be met. With the close control of heating and soaking time possible with furnace heating, combined with the clean surface maintained by the atmosphere, satisfactory bonding is consistently obtained.

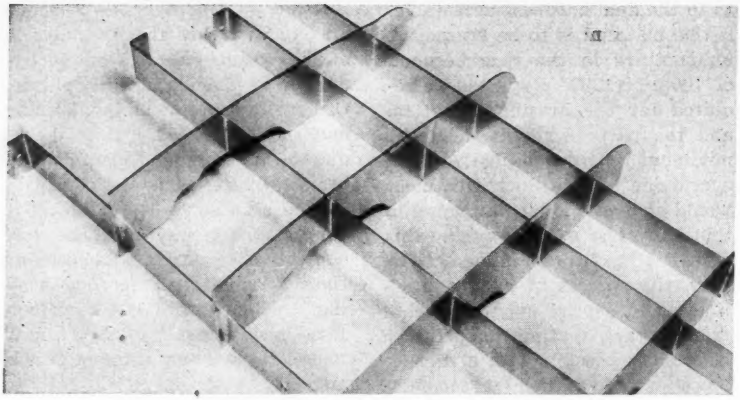
Silver brazing of nickel and its alloys is equally successful provided the temperatures are not in excess of 700° C (1290° F). Stressed material penetration of the grain boundaries by these silver alloys occurs at higher temperatures. Higher melting point alloys can be used if the nickel is annealed at a temperature higher than the melting point of the brazing alloy before brazing. Because of the zinc and cadmium content of brazing alloys which are molten at this temperature, a flux must be employed. The atmosphere assists in preventing oxide formation and protects surfaces of the assembly's components from oxidation.

Stringent Conditions for Moly—Furnace conditions for copper-brazing molybdenum, although at first appearance not too drastic, are stringent if good flow and wetting is desired. Monogas atmosphere will produce conditions in the furnace which permit the copper brazing of molybdenum parts. However, flow is found at times to





Low carbon steel assembly copper brazed in exogas. Photo at the right shows stainless and silicon steel brazed to form core at the left; at right is a coupling that is made up of low carbon steel copper brazed



Low carbon steel strip copper brazed in exogas

be inadequate, i.e., penetration through joints is not sufficient, and it has been found necessary to use dry hydrogen or ammogas together with a muffle or a separate container inserted into the furnace to induce sufficient fluidity in the brazing material. Under conditions where the ammogas atmosphere dew point can be maintained in the neighborhood of −30° C (−22° F) inside the furnace, excellent wetting and bonding are carried out.

In silver brazing this material, the most important consideration is again the fact that the fluidity and the wetting of the silver alloys is relatively low compared to copper. This, coupled with the fact that lower temperatures are employed with the result that the dissociation pressures of any oxides present are lower, means that in most cases a flux must be used.

Exogas for Steel—Most widely employed furnace brazing technique is that of joining of steel assemblies, particularly by copper brazing. Low carbon steel parts are fabricated in huge quantities by copper brazing in electric furnaces with exogas atmosphere.

If cleanliness of the surfaces is obtained prior to assembly and proper fits are employed, i.e., 0.002-inch clearance to 0.003-inch interference, furnace conditions provided by either ammogas or exogas atmospheres will bring about good flow and wetting by the copper and high strength with smooth and neat appearing joints. Oxides which might be present on the surfaces are reduced and bright clean assemblies are discharged from the cooling chamber.

Satisfactory brazing of steels where decarburization is not a problem is accomplished readily in a rich exogas type atmosphere. A dew point in the neighborhood of 25° C (77° F) is maintained in the atmosphere going to the furnace. Dew points lower than this are normally obtained with no difficulty provided cooling water in adequate quantities is available for the condenser. In some applications where a lower dew point might be required, a refrigerator can be installed to dry the gas to 5° C (40° F) or less.

Stops Decarburization—In cases where decarburization must be prevented, three alternative atmospheres exist. The first and most frequently employed is an endogas type atmosphere wherein the higher carbon monoxide and hydrogen contents, together with the low carbon dioxide and water vapor contents, result in a relatively high carbon pressure atmosphere. By controlling the dew point in the furnace within the proper range for the particular carbon content of the steel parts being brazed, carbon loss at the surface can be kept to a minimum.

It may sometimes be found more desirable to employ a rich monogas type atmosphere because of the less reactive nature of this gas mixture as well as its lower cost even though the equipment itself is more expensive. This gas would be especially desirable where assemblies are made up of steels of various carbon contents and it is desired to avoid carburization or decarburization of any of the components whether low or high in carbon. Dew point of this gas is below −60° C (−76° F) as it leaves the generator and in the furnace itself would be found to run between −15° C (50° F) and −35° C (−30° F) depending on the gas flow and gas tightness of the furnace doors and shell.

Difficult Dew Points—Use of a gas-tight metallic muffle in conjunction with dry hydrogen or ammogas makes feasible the application of these atmospheres to brazing medium and high carbon steels with freedom from carbon changes at the surface. These atmospheres must be −20° C (−4° F) or less to prevent any surface effects. Such dew points would be difficult, if not impossible, to maintain in a brick-lined furnace. For this reason, a metallic muffled furnace such as the ammogas furnace is required.

The ammogas furnace was designed primarily for bright heat treatment of air-hardening steels and stainless steels but has been found equally effective for brazing these metals. In many cases, the brazing is combined with the heat treatment, whether it be carburization or ordinary hardening, and a heat treating step is thus eliminated.

With these materials, the atmospheric requirements for prevention of decarburization are rather exacting. They are more rigid even than the requirements for good brazing so that good brazing is easily accomplished in a gas mixture satisfactory for bright heat treating the parts. A dew point of at least −30° C (−22° F) is required for air hardening steels of the carbon-high chrome, or the 5 per cent chrome, 1 per cent molybdenum types to prevent decarburization. Simultaneous brazing of these steels can be carried out also with this dew point. Here, of course, a silver brazing alloy would be necessarily made up of silver-copper with a melting point roughly suited to the hardening temperature of the steel involved.

Stainless Treatment — Hardenable stainless steels such as type 410 or 431 are also amenable to

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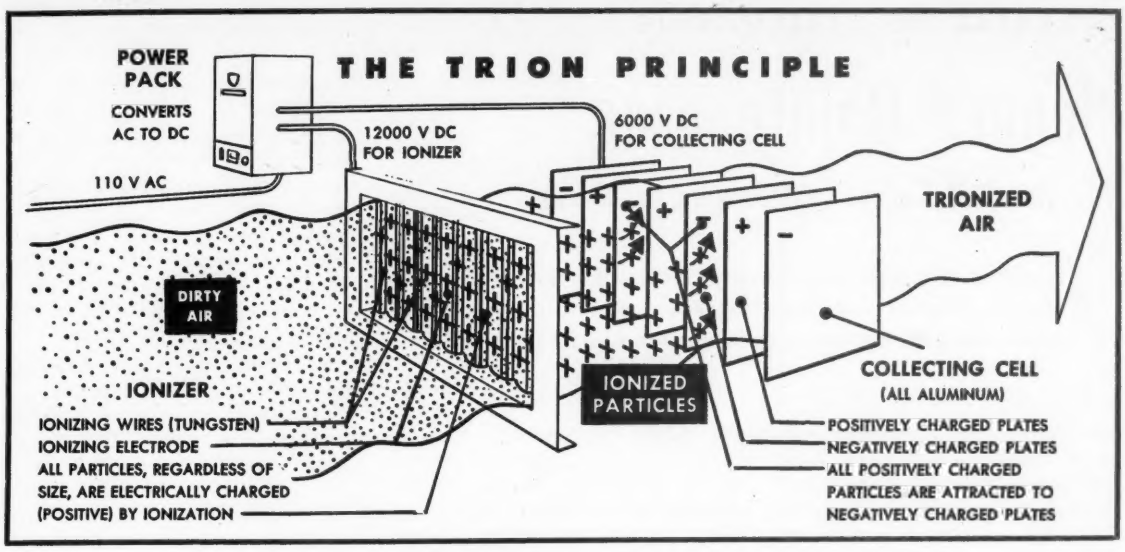


Particles are charged positive in the ionizer and then passed on to the collecting cell. They adhere to the negative plates and easily are washed off

ELECTROSTATIC FILTRATION: Dust Comes Out of the Air

Electrostatic air filters supplement mechanical filters for removal of foreign particles in air. Particles are electrically charged and attracted to plates of opposite charge

CLEAN AIR pays industrial dividends in dollars and cents. Workers producing in an atmosphere free from respiratory irritants constitute an investment in increased output. More than that, clean air will actually reduce some maintenance and operating costs.

Less frequent cleaning of building interiors is possible when a large portion of the dirt is removed from the air. Motors, electrical contacts and other equipment last longer with less maintenance when they are not subjected to dusty, contaminated air.

Supplements Mechanical — Electrostatic filters are used to supplement mechanical filters for the removal of contamination from air. Mechanical filters are effective for the removal of particles from 5 microns up. But for the particles and bacteria under 5 microns in size, the electrostatic method is required. These small particles can include common bacteria, smoke, silica dust, pollen and other airborne irritants.

Electrostatic process consists of passing the air through an ionizer where the minute particles are given a positive charge. They then are passed near a series of plates. A potential difference is maintained between these plates and as the ionized particles are passed between them the particles are attracted toward and adhere to the grounded plates.

Plates are washed at regular intervals to remove these particles. In many installations washing facilities are built-in and washing is a pushbutton operation. George F. Landgraf, vice president in charge of engineering and research, Trion Inc., McKees Rocks, Pa., points out that the electrostatic method in some cases can remove up to 99 per cent of the particles in air. Most units are rated at about 90 per cent by the Bureau of Standards.

In mill motor rooms it is important that the air be kept as clean as possible. Particles larger than 25 microns can be removed by a screening type filter, but the particles running as small as 0.01 micron in size must be removed by electrostatic air filtering. It is these smaller particles which remain suspended in the air and eventually cling to motor windings, switches and delicate contacts causing costly maintenance and repairs.

AIME Holds Northwest Session

Mining and metallurgical technologists will meet May 8-10 at Spokane, Wash., for the first Northwest Metals and Minerals Conference. More than 35 technical papers will be presented covering a wide range of interests in mining, extractive metallurgy, and physical metallurgy.

Sponsored by the Columbia chapter of American Institute of Mining and Metallurgical Engineers, the conference will be slanted largely toward students of mining and metallurgy in the Northwest. Students, educators and men from mining and metals industries in seven Western and Northwestern states and British Columbia will participate. Plant visits are included in the planned program for the session.

Planned Maintenance

Reduces Mill Delays and Production Costs

Program followed by Pittsburgh steelmaker involves seven factors. Recommendations presented in various technical papers at AISE Cincinnati meeting are highly constructive

MAINTENANCE at present may be the difference between ordinary and superlative performance and in a highly competitive field may be the difference between survival and failure. This warning was emphasized by H. F. Jacquart, master mechanic, blooming mills, Jones & Laughlin Steel Corp., Pittsburgh, at the annual Spring conference sponsored by the rolling mill committee of the Association of Iron & Steel Engineers, Netherland Plaza hotel, Cincinnati, April 28-29.

Best results in achieving good planned maintenance, he continued, are obtained when supervision considers its problems as special, and plans its program accordingly. In an industry such as steelmaking where continuous operations are present, the most costly part of a breakdown is not the actual repair but the inconvenience suffered because of a breaking down of the production operation.

Some of the most important factors to be considered in achieving planned maintenance are physical and metallurgical design, lubrication, inspection, regularly scheduled repair times, investigation of equipment failures, necessary spares and control, and equipment performance data files.

With such a program, the blooming mills division of the Pittsburgh works of J&L have reduced mechanical and electrical break-down mill delays 44 per cent, and cut cost per ton 25 per cent in spite of increased material and supply costs. Examples of methods in which this has been done have been such procedures as testing main drive couplings on a scheduled basis, with nondestructive methods thus finding flaws and cracks before actual failure has resulted.

Other technical papers presented at the Cincinnati meeting of the Association of Iron & Steel Engineers are summarized as follows:

Various Applications for Composition Nonmetallic Bearings, by Harry Gilchrist, lubrication engineer, K. W. Atwater Engineering Inc., Pittsburgh: A laminated bearing is so-called because sheets of duck canvas, burlap or linen are impregnated with a condensation resin binder and molded together into the radial form. The thickness of such radial type laminated bearings is made up by the required number of such sheets.

By this method, it would be impractical to produce a bearing having a flange to absorb the end thrust. Therefore, most manufacturers in making this type of bearing recommend a separate thrust flange which is merely cut out and machined off a flat molded slab. The bearing proper lasts from three to six times longer than the thrust flange.

The fully molded bearings have advantages as they not only can be more quickly installed by removing the old type brass bearings, but in the bearings themselves have a universal grain edge permitting them to be made as a one-piece bearing with any shape, size or thickness of flange. The resistance against wear or friction is uniform in all directions. The wearing does not change during operation, and the structure is uniform throughout.

In composition bearings, whether they are made of laminated or shredded material, or of virgin vegetable fiber, the most important thing is to produce a bearing which is absolutely homogenous, and not having too large a percentage of resinous contents, and a smooth, hard wearing surface. Bearings of the composition variety should have a relative small percentage of binding elements, should be strong enough to assure the maximum amount of crushing strength, uniform smooth running surfaces and resistance against wear.

New Installations and Developments for Increased Capacity, by G. D. Tranter, manager, Middletown Division, Armco Steel Corp., Middletown, O.: New installations and developments, during the post-war period, at the Middletown division of the Armco Steel Corp. is typical of the many expansion and development projects throughout the industry.

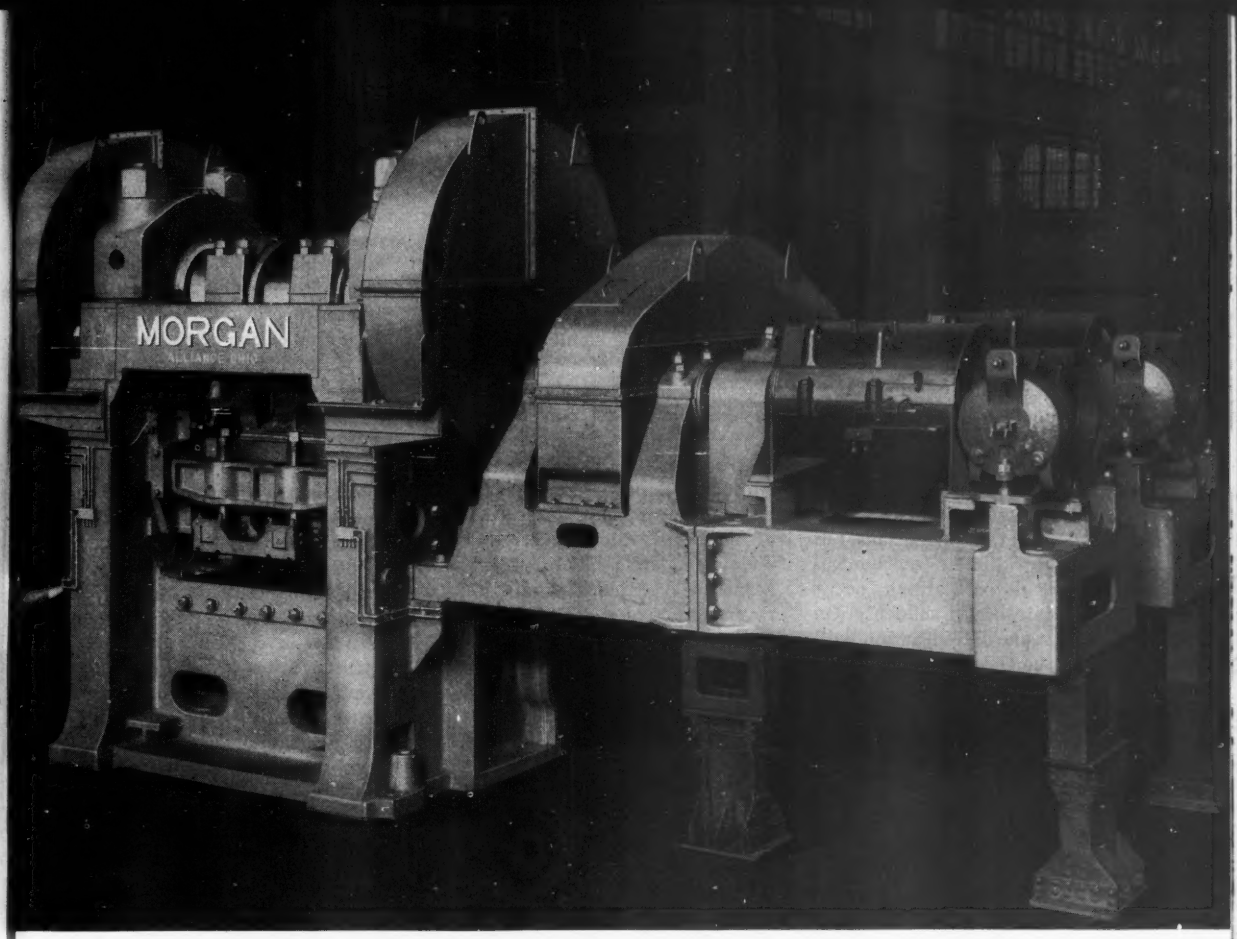
The new facilities include two continuous zinc coating units based on the Sendzimir process, two electric furnaces tapping 105 tons per heat, three 250-ton open-hearth furnaces using an entirely new arrangement for delivery of charging buggies to the charging floor, and a new blast furnace plant, now under construction, consisting of one 1450-ton furnace and 76 coke ovens.

The hot strip mill capacity has been increased by adding new soaking pits, a new slab furnace and certain mechanical improvements. Heavier housings, larger rolls, and new chutes and loopers were installed in the finishing train. The program also included larger screwdowns and motors, replacement of a coiler with one of heavier design, and the revamping of mill tables and other equipment where the need for more rugged construction was indicated.

Processing and finishing facilities have been increased and will be further augmented when additional ingot tonnage is made available through the use of more hot metal from the new blast furnace.

The new processing equipment will consist of annealing furnaces, a coil temper mill, cut up shears, and increased storage space for in-process material.

Application and Control of A-C Motors for Intermittent Loads, by R. H. Wright, Westinghouse Elec-



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Illustrated is a 1200-ton hot Slab Shear of the start-stop type with twin-motor drive.

Shear has a 12″ stroke. Designed to cut maximum 51″ wide x 6″ thick stainless steel and 60″ wide x 7″ thick carbon steel slabs.

Cutting speed eight (8) strokes per minute.

Your inquiries for mill equipment will be appreciated.

tric Corp., E. Pittsburgh, Pa.: Changing conditions in the steel industry have shifted the angle of approach to the problem of applying equipment for intermittent rolling mill loads. Improved design of sychronous motors and the increasing capacity of power systems have made it possible to eliminate flywheels for many applications.

If load is applied to a synchronous motor gradually, the input from the line will also rise gradually with no transient variations. If the load is applied suddenly, the rotor will oscillate and the line input will fluctuate rapidly and violently until the oscillations are damped out. Similar mechanical and electrical oscillations occur when load is released suddenly. On short mill passes, oscillation will be continuous throughout the pass and for some time after.

The liquid slip regulator provides the best means for controlling the input for applications requiring an induction motor and flywheel. The average speed of the system is higher and the slip losses are lower than for a fixed slip resistance. The only serious objection to the slip regulator has been its bulk. A completely new design has been developed to overcome the limitations of the older types. This regulator has forced circulation of the electrolyte and a separate stainless steel heat exchanger. The electrical system is housed in a separate control cabinet and is actuated from a standard current transformer. The setting is adjusted by means of a small rheostat.

Investigation of Material Displacement in Mannesmann Piercing by Means of Model Wax Billets, by J. L. Holmquist, director of research, Spang Chalfant Division, National Supply Co., Ambridge, Pa.: Displacement and deformation of material which occurs in the piercing of solid billets on a Mannesmann type piercing mill in the manufacture of seamless tubes are now being investigated by using billets that are made of a wax composition.

One type contains filaments of different color of wax than the remainder of the billet. These are parallel to the axis of the billet and are continuous through its length. The other type of billet contains alternate disks of different colored wax.

Types of deformation observed in piercing wax billets are classified into basic and redundant types. The relationship between the deformations which occur in piercing wax billets and those which occur when hot steel billets are pierced is discussed. It is pointed out that only the redundant deformations are subject to possible control in the piercing operation.

An application of the experimental method has been made to a study of the effect of the shape of the piercer point on the deformations. The results obtained to date in this study are presented.

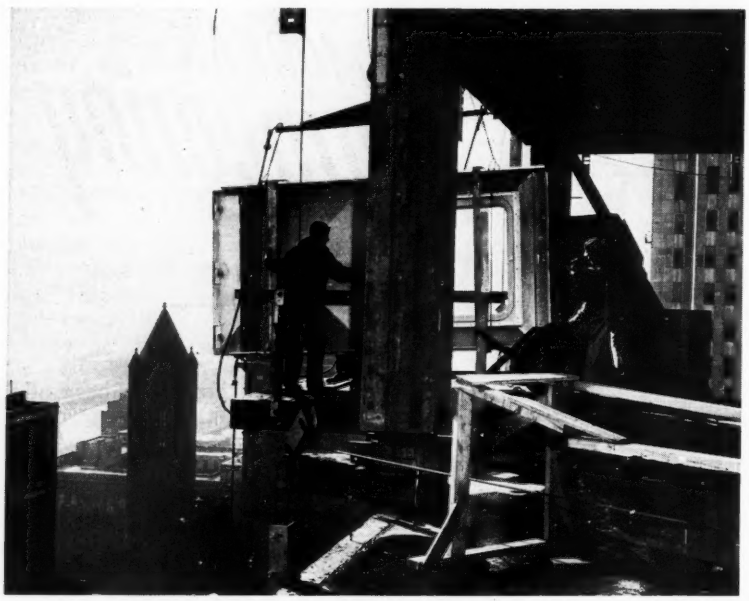
Automatic Controls for Regenerative Soaking Pits, by Griffin L. Isaacs, assistant to superintendent of blooming mills, United States Steel Co., Duquesne Works, Duquesne, Pa.: How automatic controls have been applied to regenerative soaking pits in order to decrease heating time, improve heating quality and reduce fuel rate, are explained.

The improvements were made in two stages. First, forced draft fans and automatic flue reversals were installed. Then, automatic temperature controls were added to permit complete utilization of the increased heating rate. Each stage of development is explained with emphasis on the arrangement of equipment.

The method of fired soaking used on these soaking pits is unique in that an air-fuel ratio is not maintained as air is supplied continuously at the rate required for maximum fuel flow. This continuous air system is employed to permit independent operation of each pit since two pits have common flues and a single damper.

The heating rate after each stage of development is given in terms of heating time and transit time to display the results that each part contributes to the total improvement. The adverse effect of fired soaking without temperature controls is also explained.

Steel Defects Commonly Attributed to Heating, by George Y. Boal, supervisor of metallurgical control, Crucible Steel Co. of America, Midland, Pa.: Defects in steel which can be attributed to the heating practices are sometimes difficult to separate from those caused by other reasons, be-



Prefab Panels Take the High Ride

High above the streets of Pittsburgh, exterior panels arrive for installation on the new Alcoa building. Sections are hung from within the building without exterior scaffolding. Windows pivot vertically for cleaning and have an inflatable rubber gasket which gives airtight weatherproofing

Lee Wilson

ANNEALING FURNACE DATA SHEET

NUMBER THREE

BASIC ADVANTAGES OF LEE WILSON SINGLE-STACK PORTABLE BASE FURNACES:

1. BETTER QUALITY
2. HIGHER PRODUCTION
3. LOWER FUEL COSTS
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6. LOW HANDLING COSTS

SINGLE STACK PORTABLE BASE FURNACES LOWER FUEL COSTS

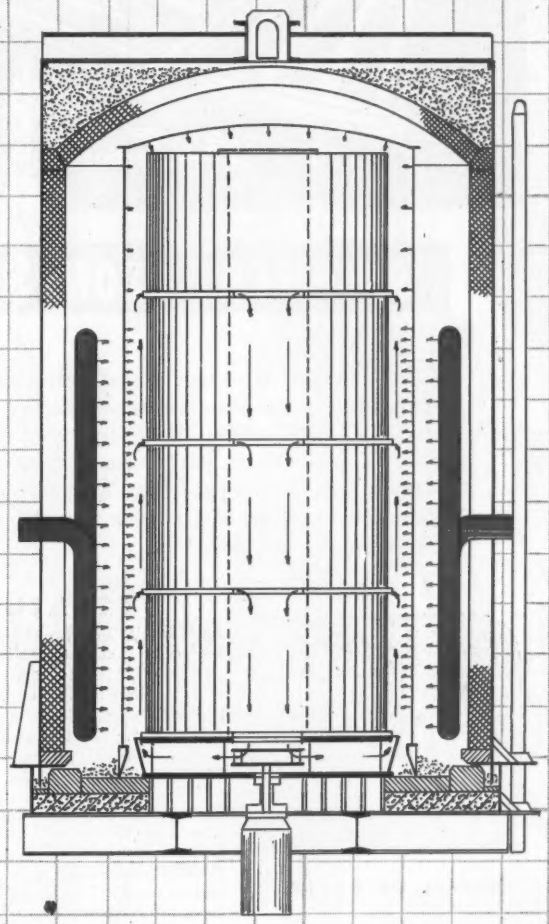
The ability to heat any given stack of steel is almost completely dependent upon the square feet of radiation surface that can be applied **around the bottom of the stack.**

By adopting tubes of the "O" design and placing them at regular intervals around the entire periphery (Fig. 1) of the inner cover the amount of radiation at the bottom of the furnace can be greatly increased and more easily controlled.

By providing twice as many heating tubes, twice as much fuel can be burned, releasing twice as many BTU units, providing much higher heating rates, resulting in faster annealing cycles. In an 8-stack furnace it is still difficult to get more than 2 million BTU's per stack. The Lee Wilson Single-Stack Furnace applies up to 5 million BTU's to each stack.

And since there are a great many more square feet of radiating tube surface in the Lee Wilson Single-Stack furnace, the tubes can be operated at lower uniform temperatures, thereby producing lower flue-gas temperatures, requiring less fuel. Too, the Single-Stack furnace has a lower radiation loss, further decreasing fuel consumption.

The Lee Wilson Portable Base Single-Stack Furnace is today's most efficient annealing equipment — **write for fully illustrated booklet** that completely explains this amazing new system of annealing.



Cross section of portable base, Single-Stack, radiant tube fired annealing furnace which, with high speed convection circulating system, offers the ultimate in bell type annealing for sheet and tin plate coils.

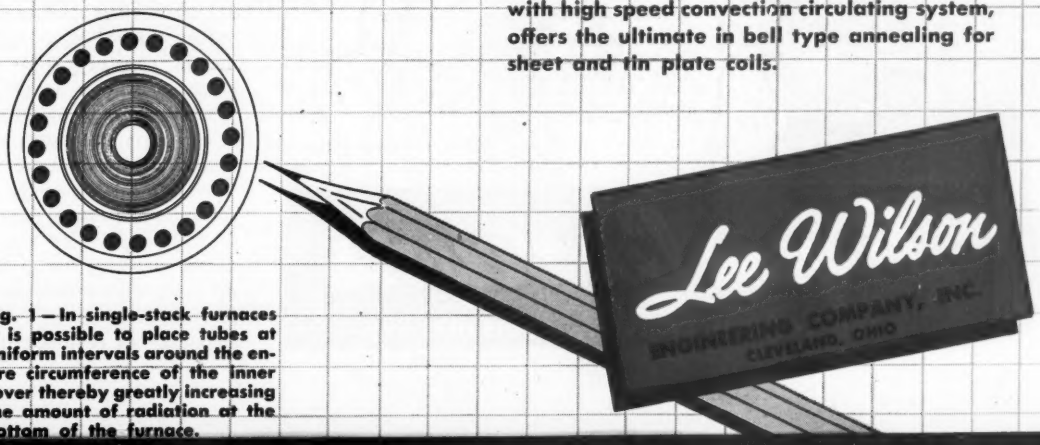
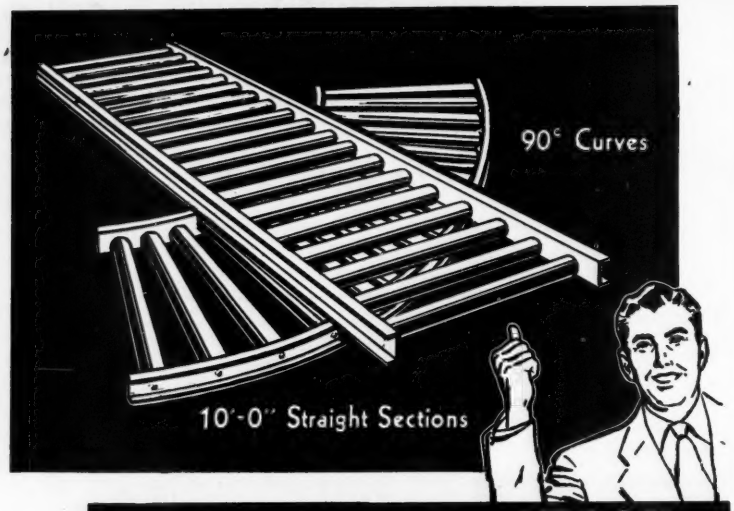


Fig. 1 — In single-stack furnaces it is possible to place tubes at uniform intervals around the entire circumference of the inner cover thereby greatly increasing the amount of radiation at the bottom of the furnace.



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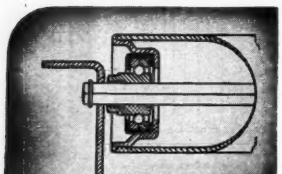
What are your needs in stock roller conveyor? Offered in several sizes for average duty conveying. Roller spacing 4" or 6" centers. Roller lengths of 12", 16" and 20". Capacity 75 lbs. per ft. with supports on 10'0" centers and 380 lbs. per foot with supports on 5'-0" centers. Both stationary and portable supports available. Write for literature.



DETAIL OF ROLLER

FEATURES

ROLLER—2¼" O.D. No. 16 Ga. Welded Steel Tubing. Pressed Steel cup secured to tubing. Cap. 150 lbs.
SHAFT—7/16" Hexagon Cold Rolled Steel. Positively locked against rotation by hexagon holes in frame.
BEARING—No. 50. Slip fit in cup, easily removed and replaced. Protected position — set back from end of roll.
FRAME—3½" x 1¼" x 10 Ga. Pressed Steel Channel. With four 1-5/16" O.D. 13 Ga. Welded Tubing ties per 10'-0" section. Capacity 75 lbs. per foot with supports on 10'-0" centers and 380 lbs. per foot with supports on 5'-0" centers.
COUPLING—Furnished with bolted type for stationary service. Can furnish hook type for portable service if preferred.

ALSO Stock WHEEL CONVEYORS

In both straight and curved sections. Ideal for portable use. Light-to-medium duty. Write for details.

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cause many factors are involved in the analysis of defects.

Brief consideration is given to the chemistry of furnace atmospheres and the factors which change this chemistry, including the fuel used, ratio of air to fuel, furnace pressure, and combustion controls. Time at temperature, of primary importance in its effect on steel quality, is affected by furnace size, method of operation, and novel designs, such as high-speed heating.

After an introductory discussion of the general importance of furnaces and their operation, the various common defects are examined, with an effort made to assign specific causes and reasons for the development of the symptoms which characterize the defect. These reasons may include many factors, such as:

1. Chemical effects.
2. Plasticity as effected by temperature.
3. Differential expansion and contraction.
4. Mechanical strain with uneven heating.
5. Overheating.

Inertia Studies for Modern Mill Drives, by J. F. Sellers, engineer-in-charge, d-c motor & generator design, and T. B. Montgomery, engineer-in-charge, control design, Allis-Chalmers Mfg. Co., Milwaukee: Where a consequential amount of work is done simultaneously by a number of independent drive motors in reducing steel, simultaneously on the same strip, not only are the electrical characteristics carefully chosen but also the mechanical characteristics. The motors are working mechanically in parallel on the same load.

In the tandem mill, a notable example, since it is necessary to accelerate and decelerate the mill during the rolling of each coil, the inertia constant WK^2 of motors needs be as low as practical, particularly in high speed mills. This is necessary to keep from overloading machines beyond their short time current capacity. It follows that motor torque must be added during acceleration and subtracted during deceleration in the required amounts with exactness if constant tension is to be held in the strip. Accuracy is required if tension is

"SO THAT'S WHERE THOSE LITTLE PIGS WENT!"

CHIEF KEOKUK: Sure enough, dear! Thousands of Electro-Silvery pigs were melted down to help make the iron and steel for those skyscrapers . . .

PRINCESS WENATCHEE: . . . and wasn't Electro-Silvery used in making the metal for this boat we're on, and for tanks and tractors and automobiles?

CHIEF KEOKUK: Right! It's hard to find *any* type of product made of iron or steel that *doesn't* use Electro-Silvery!

CHIEF KEOKUK JR: Gosh, Pop, what *is* Electro-Silvery?

CHIEF KEOKUK: Electro-Silvery, son, is a form of ferro-silicon that acts as a vital control element in the production of iron and steel . . .

PRINCESS WENATCHEE: . . . and the world's largest producer of this vital ingredient is the Keokuk Electro-Metals Company!

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WENATCHEE DIVISION: WENATCHEE, WASHINGTON

Keokuk Electro-Silvery is used by foundries and steel plants in the form of these three pigs, weighing 60 pounds . . . 30 pounds . . . and 12½ pounds.

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BUSHINGS MUST MEET 3 RIGID NORTON SPECIFICATIONS

These Worcester Stamped Metal bushings are precision made to the following specifications, so that NORTON fast-cutting abrasive saws will seat properly on the arbor:

1. **The drawn center hole in the stamping must be held to .002" tolerance in diameter.**
2. **The drawn center hole in the stamping must be concentric to the O.D.**
3. **The stamping must be absolutely flat, as the least tendency to "dish" will allow abrasive grains to work under the part and wear the arbor.**

Just as thousands of these bushings are molded into NORTON cut-off wheels to satisfactory specifications for use all over the world . . . so are many other important Worcester Stamped Metal component parts produced to make a BIG difference in accurate end use.

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to be varied in a given relation, as speed varies.

To obtain the most delivered torque at specified speeds, for a minimum quantity of material, iron, copper, etc., finite physical relationships must be adhered to, otherwise the gain in one characteristic is made at the expense of increase in some other. With increase in mill speeds, the WK^2 of the mill, referred to the motor shaft, has increased to the point where the mill is such a large per cent of the total that further reduction in motor WK^2 is uneconomical in reducing the total for mill and motor.

Selection and Analysis of Regulating Systems for Mill Drives, by W. E. Miller and F. S. Rothe, General Electric Co., Schenectady, N. Y.: Outstanding production records being made today in the steel industry are to a considerable extent the result of improvements in the art of regulating system design. A successful application of regulating equipment involves a thorough understanding of the process involved and an appreciation of the factors affecting product quality as well as tonnage. The first and most important step in the application of regulating systems is to select the right type of system for the job. There are four fundamental quantities in electrical systems that can be regulated:

1. Position.
2. Speed.
3. Voltage.
4. Current.

A decision must be made as to the accuracy, speed of response, and system damping required by the process. A choice must be made as to type of regulating equipment. Today we have contactor systems, amplidynes, amplistats, electronic amplifiers and sensing devices, and combinations of these basic forms. Experience with all types and a knowledge of the performance characteristics of each are essential to make the proper selection.

A preliminary analysis is required to determine the approximate rating and order of magnitude of the constants of the components of the system. Studies are then made using one or several of the available analyzers to determine the exact effect of

Amid the crashing of forest giants and the chug-chug of burdened tractors, you'll find McKay Chains at work lifting, hauling, holding, rigging and otherwise helping lumbermen move their products to the markets of the world.

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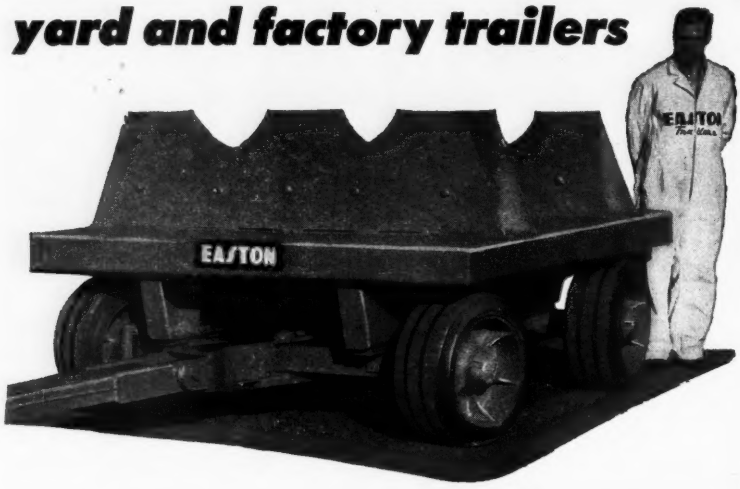

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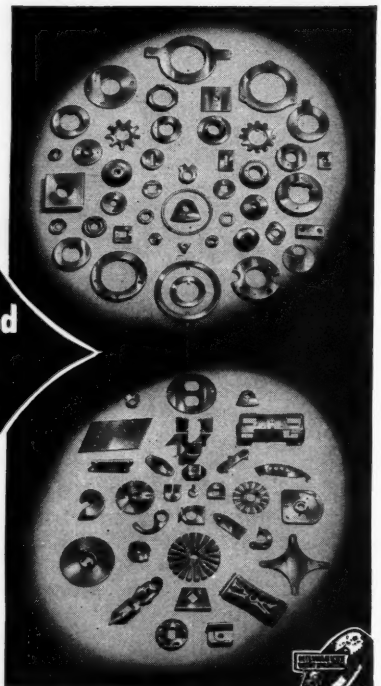

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changes in component characteristics, ratings and system circuits upon over-all performance.

Operation and Roll Design of the Gary Rail Mill, by R. W. Dickson, division superintendent, central mills, United States Steel Co., Gary, Ind.: Use of an edging pass in dummy stand, the application of head and base wheels in leader and finisher stands, respectively, and the wide range of products currently produced on the Gary rail mill, which rolled a record tonnage in 1951, are reviewed.

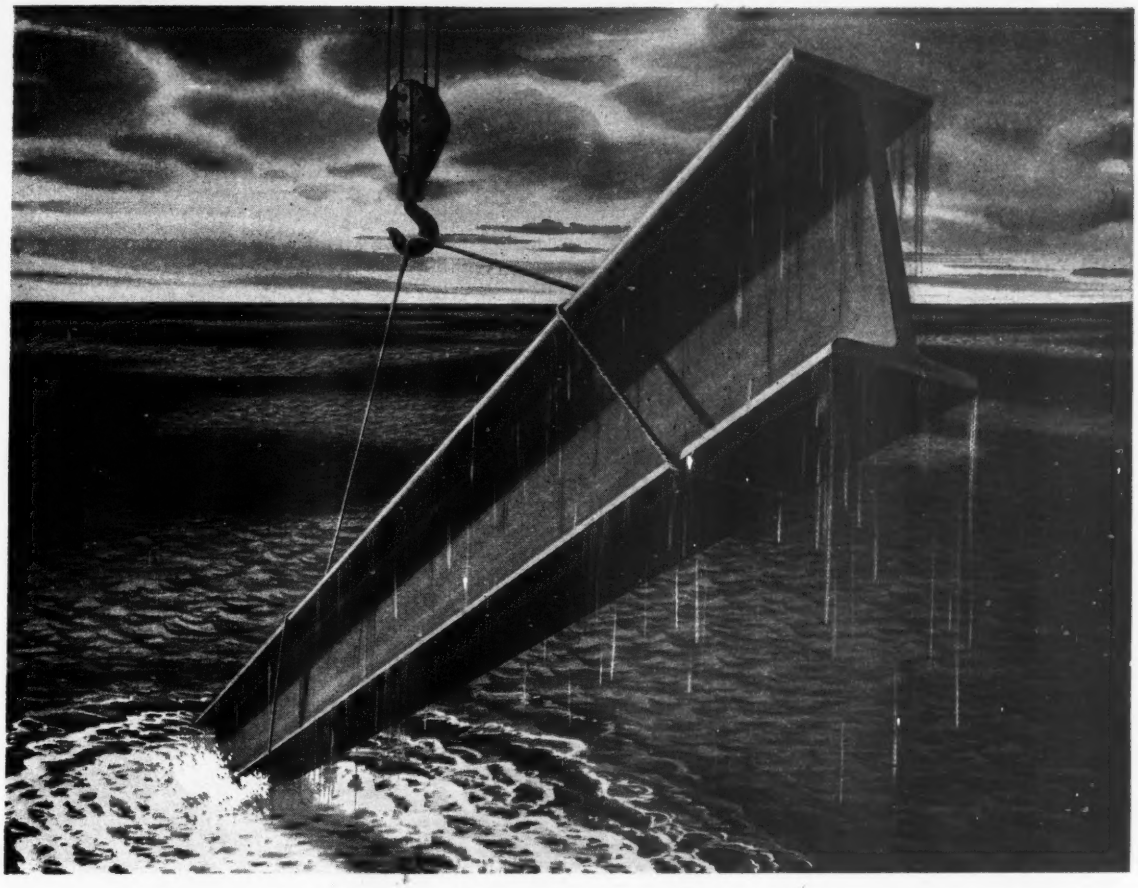
Use of a tongue and groove style of rolling, which differs materially from the conventional rolling in the dummy pass, and the use of roller bearing head wheel in the leader and roller bearing base wheel in the finisher, produces rails of extremely close tolerances in relation to section templates, freedom from objectionable center base seams and flat base.

An intensive development program to make the mill competitive in the rolling of products other than rails has resulted in the installation of many additional facilities.

Products currently being produced on this mill in addition to rails are billets, slabs, rounds and die-rolled crankshaft billets.

A unique schedule permits maximum use of down periods for roll changes so that roll change delays involve less than 5 per cent of the operating time, even when operating the mill 18 turns per week. The mill has a slow cooling capacity of over 9000 tons and is capable of slow cooling all products rolled on the mill if so required.

Factors Which Influence the Surface Quality of High Sulphur Steel, by George G. Blean, steel works metallurgist, Jones & Laughlin Steel Corp., Pittsburgh: Proper pit time/track ratios are shown to be necessary to help maintain the highest level of surface quality. In discussing the blooming operations, emphasis is placed upon light initial drafts with ingots heated to finish at 2100 F or above. The effectiveness of saddening on the billet quality of the more sensitive grades is illustrated. Hot scarfing or desurfacing is discussed and some results showing the effectiveness of this practice are



Sea water...secret of more steel!

THE secret of improved furnace bottom performance—and increased ingot production for you—is high purity periclase derived from sea water magnesia.

Higher in MgO, lower in impurities than magnesite, this sea water *periclase* is the heart of Permanente 165 ramming mix.

Proved superior by many of the industry's most progressive companies, Permanente 165 *retains highest strength at operating temperatures*—gives maximum refractoriness and maximum resistance to chemical attack.

Pre-shrunk for high density, the sea water periclase of patented Permanente 165 is bonded to *full depth* by crystal bridging—a solid phase reaction.

Result: protection from costly breakthroughs, less down-time for repairs between heats, more tonnage per year!

YOUR Kaiser refractory engineer will give prompt attention to your refractory problem—will offer, where desired, research, design and installation service to give you maximum production most economically. Write for descriptive literature on Permanente 165 and on the companion ramming mix, Permanente 84. Principal sales offices: *Chemical Division*, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California. First National Tower, Akron 8, Ohio.

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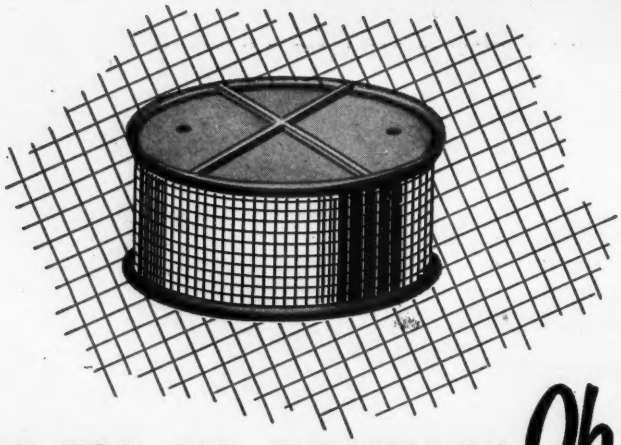

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You don't have to see the efficient air cleaner to know that it's there. It's the same with Reynolds wire cloth—chosen by so many makers of air cleaners.

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NS NATIONAL-STANDARD Company NILES, MICHIGAN

shown. In rerolling the billets to bar products, it is stated that little difficulty is encountered as the red shortness characteristics appear to be more troublesome in the cast structure.

Accident Control in Rolling Mills, by Carter Kendall, chief safety engineer, Bethlehem Steel Co., Bethlehem, Pa.: Accidents involving injury to personnel and those that do not produce injuries should be controlled if maximum production is to be attained. Both classes respond to the same controls, corrective measures and devices. Unless accident control is integrated with production, the returns will be strictly limited. It should be planned and built into the production steps right from the start.

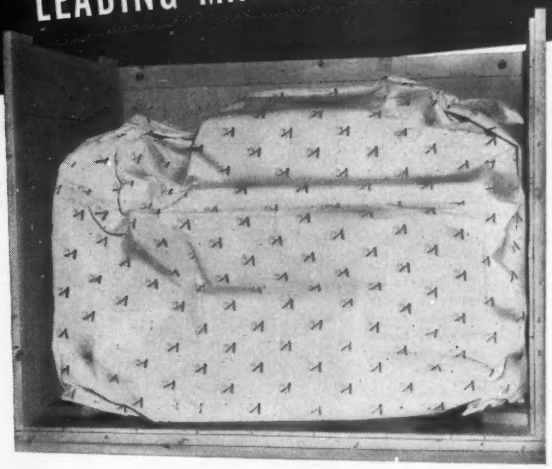
Positive interest on the part of the men, full supervisory co-operation, and adequate training of personnel must be brought about if the accident control plan, which should be integrated with production, is to be effective.

Bearing these points in mind, and the demonstrated need for planned accident control, a method of approach is recommended that includes the analysis of each job performed, by listing each step taken. Opposite each step, the hazards of that step are recorded and against these hazards the controls that can be employed to overcome the hazards are entered. This procedure, termed "Job Safety Analysis" has proved to be helpful.

The analysis itself is made by the foreman who must discuss it with his men which brings them into the picture as well. This plan of attack helps to stimulate interest of workers, ensures supervisory co-operation and serves as a training program for men and foremen as well.

If, in spite of careful accident control work, accidents still take place, the causes should be checked against the job safety analysis and all errors or omissions rectified. By this means a thorough and accurate set of analyses can be assembled that will become an excellent training aid as well as a guide for production and accident control, and both safety experience and production should improve.

HOW NOX-RUST VAPOR-WRAPPER SAVES $15,000 PER YEAR FOR A LEADING MANUFACTURER*



Through use of an amazing new rust-preventive product . . . Nox-Rust Vapor-Wrapper . . . one of America's leading manufacturers* estimates that it has saved over $15,000 each year for the last two years in packaging costs alone. What's more, approximately 6,250 man-hours per year have been saved in the elimination of previous preservative packaging methods. Units now packaged in Vapor-Wrapper arrive clean, "factory-fresh," rust-free and ready for instant use. Thus, large savings in set-up time are made possible.

INDUSTRY SWITCHES TO VAPOR-WRAPPER

Vapor-Wrapper eliminates the need for application and removal of messy, old-fashioned rust-preventive coatings. Because of this fact, leading makers of automotive and aeronautical parts and equipment as well as other vital segments of the metal-working industry have switched to Vapor-Wrapper. For details on how your firm can benefit with Vapor-Wrapper, just mail the coupon below. You'll receive full information without obligation.

* Name on request

CAUTION . . . Only Nox-Rust makes the exclusive new Vapor-Wrapper that's impregnated with Callex . . . the patented VOLATILE CORROSION INHIBITOR. (U. S. Patents 2,521,311—2,534,201—other patents pending).

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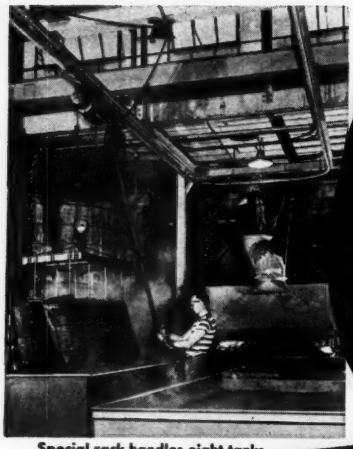
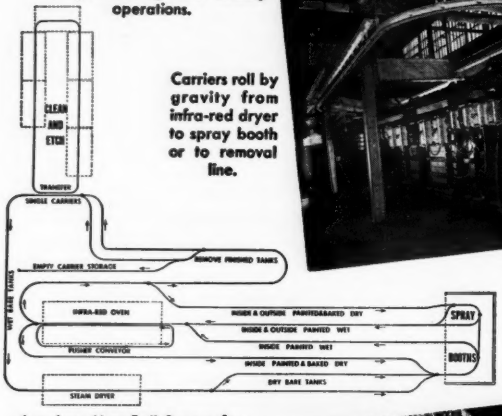


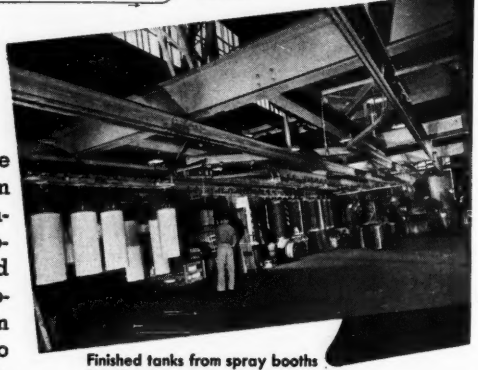
PERMUTIT "Softens" THEIR HANDLING JOBS, TOO

Special rack handles eight tanks through cleaning and etching operations.

Carriers roll by gravity from infra-red dryer to spray booth or to removal line.



American MonoRail System for finishing water conditioner tanks at the Permutit Co., Birmingham, N. J.



Finished tanks from spray booths (rear) roll to pusher conveyor in foreground.

This installation in the Permutit Company again demonstrates the versatility of American MonoRail engineering and overhead handling equipment. Every step from cleaning and etching to finished painted tank is done by a continuous "flow" operation. The system boosted production, cut handling labor, improved space utilization, reduced material damage, bettered working conditions and improved production control.

American MonoRail engineers can show you how to increase production and lower costs in your plant. Just drop us a line.

SEND FOR BULLETIN C-1.

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Magnesium Fabrication

(*Continued from Page* 101)

stretched on hot punches. Punches are made magnesium as well as other metals.

Impact or back extrusion process is being used extensively to form magnesium. Typical conditions for forming small parts from FS alloy magnesium slugs average about 100,000 psi at temperatures from 450 to 550°F. Production punches are tool steel or carbide. Slugs are preheated. Dies are heated with gas or electricity. Both mechanical and hydraulic presses can be used.

Spinning—Annealed magnesium sheet can be spun only very lightly at room temperature. At elevated temperatures it can be deformed as severely as aluminum and with similar techniques. Mandrels are generally made of magnesium or aluminum and conventional spinning tools are used. Mandrels and sheet are heated with gas torches and must be kept at temperature during working.

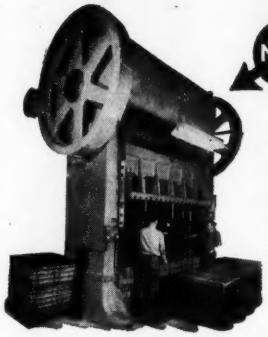
Riveting—Riveting of magnesium alloys is similar to riveting aluminum alloys. Choice of rivet alloys is limited. Magnesium rivets are unsuitable because of work hardening during cold driving. Experience shows rivet alloys should be limited to 56S aluminum because of its low electrolytic potential with magnesium. Other aluminum rivet alloys, as well as steel, copper and brass, in presence of an electrolyte result in galvanic corrosion, weakening joint.

Drilling and piercing are both used to make rivet holes in magnesium. Drilling is preferred. Piercing results in a flaky edge, especially in the thicker gages above 0.040-inch, and fatigue strength is reduced. Both pneumatic hammers and squeeze riveters are used on magnesium alloys. Tests conducted by Dow Chemical show that bucktails, with a height 4/10 the rivet diameter and a diameter of 1 1/3 times rivet diameter, are sufficient to develop full-strength joints. Cracking is minimized.

Trimming, drilling, machine countersinking should be done prior to chemical treatment and finishing to eliminate poorly protected or unprotected areas.

Welding — Electric arc welding

BIG PRESSES *to make*



NEW

500 TON BLISS MECHANICAL: double crank; bed area 120-in. by 60-in.; shut height 46-in.; stroke 20-in.; with cushions.
Trim, pierce, and hole cut operation on vending machine door panel.

LEAKE *Created** Metal Stampings

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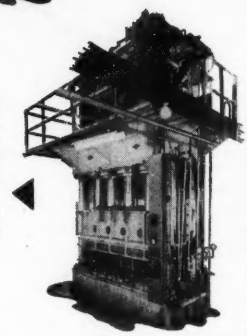
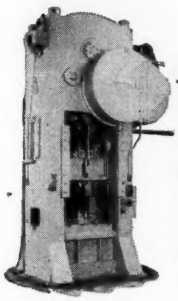


750-250 TON MARION HYDRAULIC: double action; bed area 120-in. by 60-in.; daylight 69-in.; stroke 42-in.; with cushions.
Ready for single action production—cam piercing 5/16-in. metals.

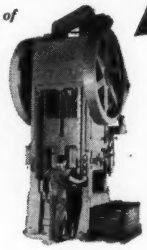
It's unusual for a commercial stamping company to be so well equipped to handle "big stamping problems" for customers. But the Leake Organization is fully prepared with these "big fellows" to provide the *right* facilities for the particular job.

In the modern equipped Leake plant there are many presses, in size and type from *300 strokes per minute with automatic feed*, to other presses, mechanical and hydraulic ranging up to *2500 tons capacity*. Here you will find the *right press*, or *combination of presses* to efficiently and economically produce any pressed metal job. Take advantage of this operating flexibility to hasten delivery and reduce costs.

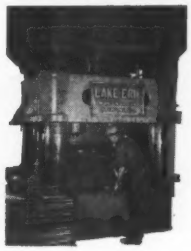


400 TON CLEARING MECHANICAL: crankless; bed area 42-in. by 36-in.; shut height 20-in.; stroke · 20-in.; with cushion.
Ready for production of deep drawn stampings.

NEW



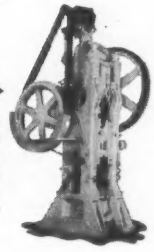
250 TON BLISS MECHANICAL: single crank; bed area 33-in. by 39-in.; shut height 27-in.; stroke 14-in.; with cushion.
Blanking and piercing heavy gauge plate.



2500 TON LAKE ERIE HYDRAULIC: single action; bolster area 120-in. by 59-in.; daylight 48-in.; stroke 36-in.; with heavy duty spring cushions.
Drawing operation on 1/4-in. steel cover—4 1/2-in. deep.

750-400 TON CLEARING HYDRAULIC: double action; bed area 150-in. by 72-in.; daylight 94-in.; stroke 66-in.; with cushions.
Drawing huge truck cab roof.

750 TON WILLIAMS WHITE HYDRAULIC: single action; bed area 48-in. by 96-in.; daylight 60-in.; stroke 40-in.; with cushions.
Drawing 1/4-in. NAX high tensile steel for a government part.



350 TON TOLEDO MECHANICAL: single crank; bed area 24-in. by 24-in.; shut height 21-in.; stroke 10-in.; with rubber cushion.
Ready for production of heavy gauge stampings.

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Unique Fitting design provides quick, easy assembly and assures positive grip on hose. No adjusting is required after assembly.

Hose is constructed of seamless synthetic rubber compound reinforced with two cotton braids and a high tensile steel wire braid.

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AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

has been adapted to magnesium through the inert gas shielded metal arc process. Filler metal of magnesium alloy is fed into the molten pool by a separate rod as in gas welding. Amount of heat required to fuse the metal is low. However, high coefficients of expansion and thermal conductivity of magnesium are a source of considerable distortion. Jigging should be designed to control this.

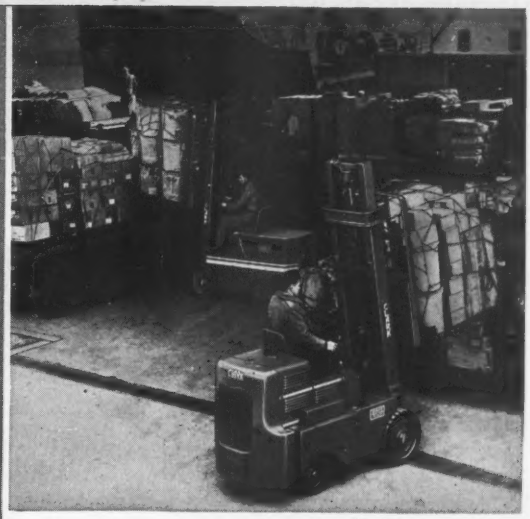
For welding alloys in the hard rolled temper, arc welding is recommended. Typical properties of arc welded magnesium alloys are shown in Table II. M, J and FS wrought magnesium alloys are all welded in production as well as most casting alloys. Filler rods are generally same alloy as material being welded. In the case of H alloy castings, a lower solidifying rod, is recommended. FS alloy sheet is sensitive to cracking in welding and an alloy such as J or C is recommended. Either has a lower solidification point. Shielded arc welding process is also used for repair of defects in castings.

Both direct current machines of the stable arc type with continuous amperage control, and alternating current machines with a high frequency current superimposed for stabilization on normal welding current, are used on magnesium alloys. On material over 3/16-inch thick, alternating current machines are preferred because of greater penetrating power. Welds have been made on plates greater than ½-inch thick without beveling edges.

No Stress Relief—According to Dow no stress corrosion cracking occurs in arc welded M alloy structures. Stress relieving is not necessary. However, tests have shown that a stress relief of 15 minutes at 500°F for FS1 annealed sheet and extrusion alloys is satisfactory.

To retain the hard rolled properties of FS1-H24 sheet, temperature must be reduced to 300°F for 60 minutes. Stress relieving jigs are used to prevent distortion at elevated temperatures.

Magnesium sheet and extrusion alloys are spot welded on equipment similar to that required for aluminum. Spot welds have excellent static strength. High quality



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Every CLARK fork-lift truck saves money—
—a *lot* of money—for its user. Some save more than others because they are used more effectively — more efficiently — more regularly. They aren't allowed to stand idle "in between jobs." Demountable CLARK attachments enable them to do at great savings many jobs outside the popular concept of materials handling (snow plowing, coal shoveling and plant maintenance work, for example), and to do more and better jobs within that concept. Let CLARK help *you* make the most of and get the most from *your* fork-lift trucks. For your profit's sake, talk over your handling operations with the CLARK dealer nearest you—he's listed in the Yellow Pages of your telephone book.

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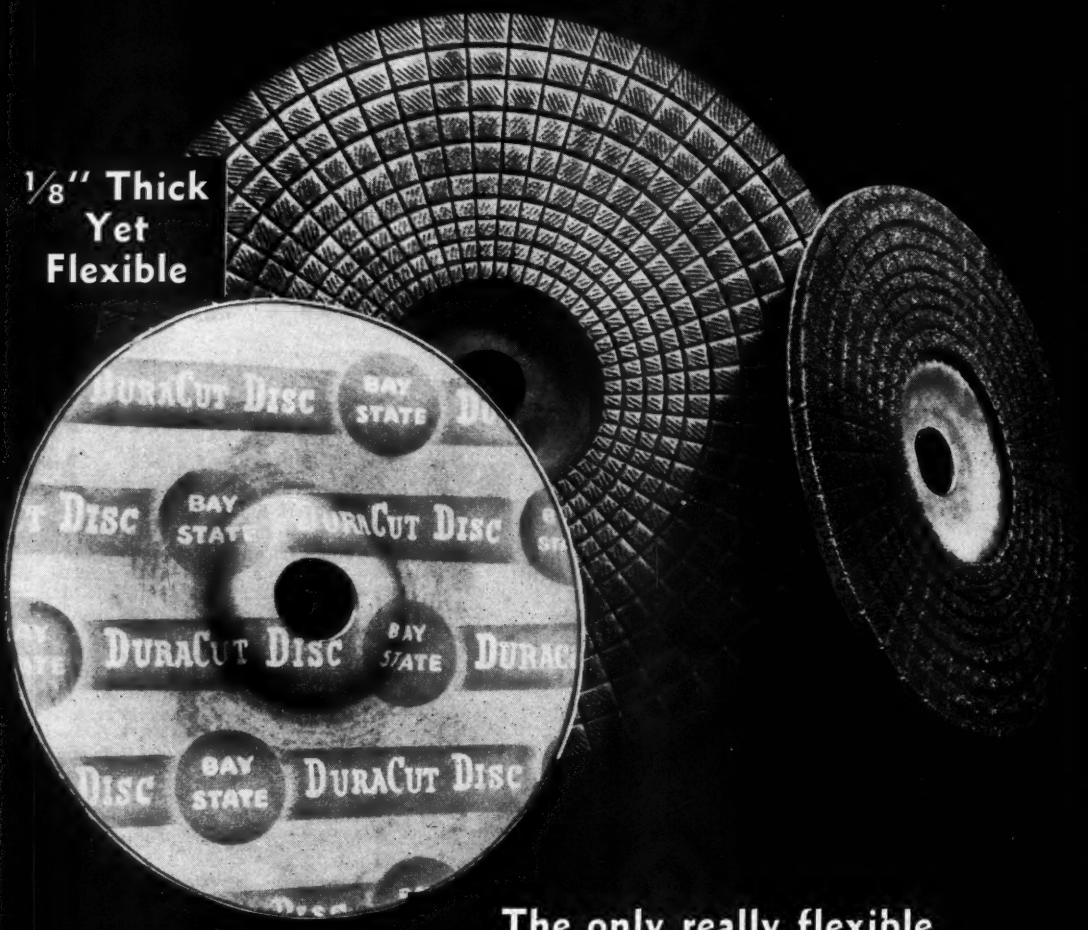

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for blending welds the *Better* way

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DuraCut's unique waffle pattern with multiple layers of abrasive grain allows sharp, instantaneous cutting throughout the life of the wheel. Whether it's light snagging, smoothing or blending, there's a wide range of specifications to assure obtaining a fast-cutting, long-lived wheel for your job.

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Every component part, from bond to backing, is designed and treated so as to lend added strength and flexibility to the finished product.

TYPICAL APPLICATIONS:

Finishing light welds on sheet metal jobs. Automotive, truck, railroad car or locomotive and aircraft body work. Blending welds on sinks, refrigerators, stoves, metal cabinets. Rust and scale removal.

ask for a demonstration on your work

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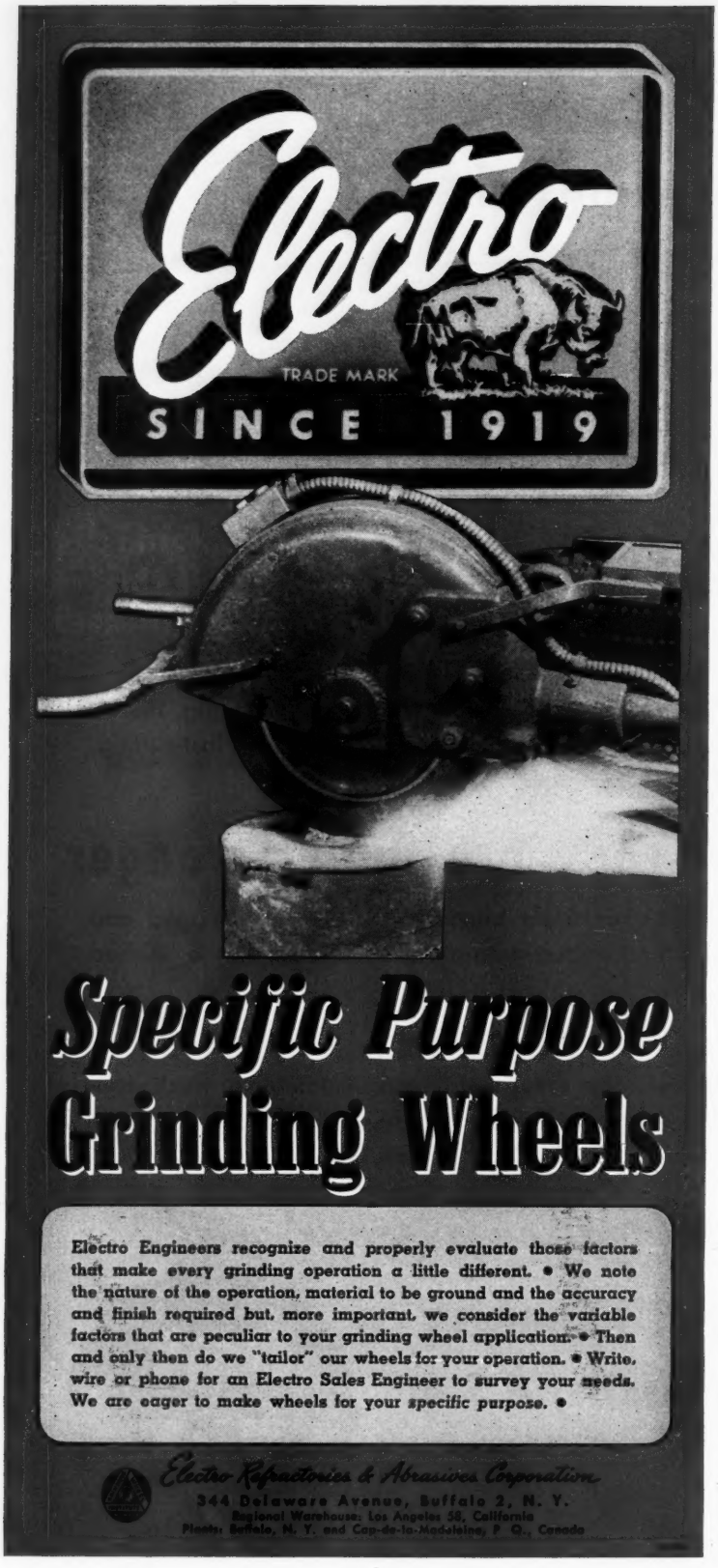
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welds of consistent strength can be obtained, providing surfaces are properly cleaned and weld current, electrode pressure and welding time are closely controlled.

Enough experience has been obtained to indicate that flash welding can be adapted to high production joining. M alloy is difficult to weld because of its narrow solidification range, but FS1, J1 and O1 have been flash welded with joint efficiencies of 85 per cent to 95 per cent. Rapid pushup is required because of the high conductivity and narrow freezing range, so machines with automatic pushup should be used. Oxide film need not be removed prior to welding as in other types of welding.

Adhesives—Recently, many successful magnesium applications in aircraft have evolved from new adhesive bonding techniques. Fatigue life of adhesive bonded joints is high. The continuous bond results in less stress concentration. Adhesive fills the faying surfaces and excludes water and corrosive materials. If dissimilar metals are joined to magnesium, adhesive prevents galvanic corrosion.

Metal adhesives are applied as a liquid adhesive, or as a tape between the surfaces. Heat and pressure cures adhesive to a high strength bond. Some adhesives set at room temperature, but highest properties are obtained by curing.

Shear strength of magnesium alloy bonds is lower than between aluminum and steel because of lower modulus of elasticity of magnesium. Shear strengths are dependent upon the surface treatment of the metal before bonding. Highest initial shear strengths are obtained over bare magnesium which is carefully cleaned.

Film Shows Maintenance Lifts

Value of fork lift trucks and towing tractors in plant maintenance operations is shown in a motion picture, "Serves You Right," released by Clark Equipment Co. Movie takes 15 minutes; is in black and white, with sound.

Film is available to groups interested in plant maintenance and materials handling. Requests should be addressed to the firm's Industrial Truck Division, Battle Creek, Mich.

Melting Capacity
30,000 pounds per hour

-and five men
do it all

AJAX INDUCTION FURNACES

In operation at the Waterbury, Conn. plant of the Scovill Manufacturing Company

As a part of the most modern and completely integrated brass cold rolling operation in the world, Scovill Manufacturing Company of Waterbury, Connecticut, has in operation three 1000 kW. Ajax-Scomet electric induction melting furnaces with a production of 10,000 pounds each per hour. These furnaces, the largest in the brass industry, are equipped with the most precise control of melting temperatures by means of a permanently inserted thermo-couple and have thereby considerably reduced melting losses.

Every half hour each of these furnaces in turn discharges its 5,000-pound charge into a ladle which is transferred by crane to a holding furnace (shown at right) of 9,000 pounds capacity. This furnace is mounted over the continuous casting machine located on the floors below, and thus is able to provide a permanent flow of molten brass to the mold. The intermixing of the charges from the three furnaces gives additional uniformity of composition.

WRITE FOR FURTHER DETAILS ABOUT AJAX FURNACES

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And there's more. For *every* man in your nearby Carpenter MILL-BRANCH WAREHOUSE, there are *hundreds more* in the Reading Mill waiting to work for you. That's the difference. For Carpenter's warehouses are MILL-BRANCH WAREHOUSES. Every time you call you have a direct line on Mill Laboratory and Metallurgical Help, Mill Quality and Uniformity—*comprehensive* Mill Service.

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SPECIALTY TOOL • ALLOY • AND • STAINLESS STEELS

Furnace Brazing

(*Continued from Page* 104)

treatment of this sort. The parts are cleaned thoroughly before assembly; the brazing alloy is preplaced at the joint; and the part is run through the hardening cycle and simultaneously brazed. Dew point must be at least −30° C (−22° F) in the furnace.

Ammogas furnace also makes possible an alternative method often employed with the tool steels. This method is also applicable to the brazing of austenitic stainless steels. Copper is employed as the brazing material. Temperature, therefore, is 1100° C (2012° F) or higher. With this treatment, a dew point of −30° C (−22° F) should again be sought with the tool steels since the problem of decarburization is still present. For stainless steels, both austenitic and hardenable, the dew point can be no higher than −20° C (−4° F) since the dissociation pressure of chromium oxide is much greater at this higher temperature.

Nitriding Steels Brazed—Nitriding steels cannot ordinarily be satisfactorily brazed in a furnace without using a flux. In addition, requirements of the heat treatment demand that the brazing heat be controlled at temperatures in the neighborhood of 700° C (1290° F) to prevent softening of the core or production of free ferrite. If a sufficiently low dew point, −50° C (−58° F) or lower, can be maintained in the heating chamber, nitrided steel can be copper brazed; but this brazing treatment must then be followed by a quenching and tempering treatment to develop the necessary properties in the nitriding steel before it is nitrided. Such a brazing treatment will not decarburize the parts if ammogas atmosphere of the recommended dew point is employed.

In some cases, it is not possible to maintain the dry atmosphere within the box or muffle that is required for copper brazing nitriding steel. The more easily applied treatment then is to braze the heat treated steel with a low melting point silver solder using flux and holding the temperature at 700° C (1290° F). Such a treatment is carried out with endogas or exogas as the atmosphere in a furnace where temperature control is assured. This operation can then be followed by nitriding.

Cast Iron Silver Soldered—Often it is desirable to braze cast iron. Either silver solder or copper can be used for this, but a flux is necessary with the former and care must be exercised with the temperature control of the latter to avoid melting the cast iron. Very often a machined surface can be brazed readily with no special cleaning required. In some cases, however, the cast iron is found to resist wetting. This is apparently due to the presence of free carbon in the surface. Presence in the cast iron of elements such as chromium or silicon in larger than ordinary amounts will also result in interference with brazing.

Cleaning of cast iron by treatment in a Kolene or a Virgo salt bath will improve wetting of the brazing material considerably. This applies to the use of either copper

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AUTOMATIC THREAD ROLLER
MODEL A-312-H
The Hartford Special Model A-190 Automatic Thread Roller has now been on the market for more than three years. During this time it has met with universal satisfaction from its many users, and this favorable reception and experience by the trade has naturally influenced us to design and develop a larger capacity machine.
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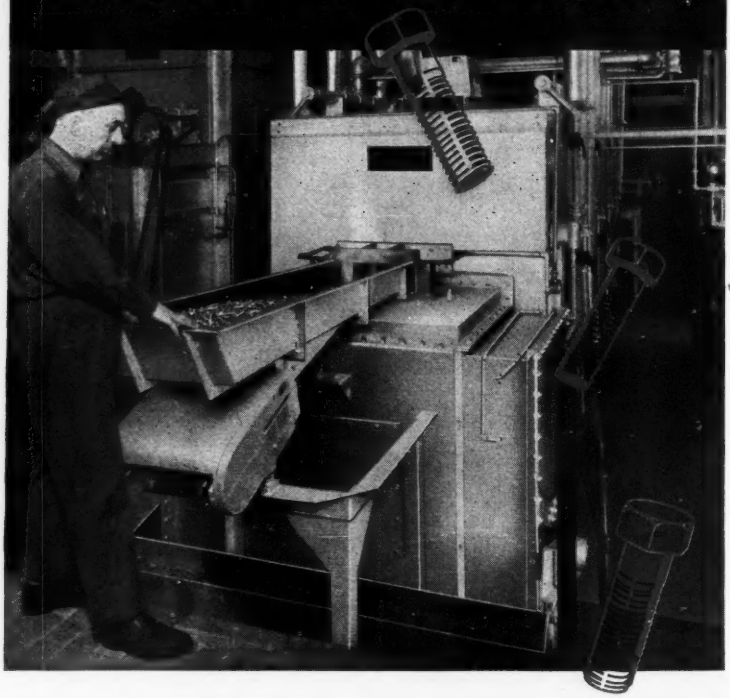

. . . at Commercial Steel Treating Corp., Detroit

Production heat treating of bolts—1000 pounds each hour—at Commercial Steel Treating Corp., Detroit, is accomplished in this Holcroft furnace which clean hardens, case hardens or restores carbon.

All operation, except for loading is fully automatic. Bolts are loaded into a vibrator and carried through the furnace on an endless belt conveyor. The stock is carried from the quench, across to the washer and tempering furnace, returning to a position near the loading vibrator. Furnace atmosphere is provided by a Holcroft endothermic gas generator.

Gas-fired radiant tubes—easily replaceable without furnace shut down—heats the hardening furnace. Also included in the arrangement is a Holcroft direct-fired, recirculating type conveyor furnace for tempering as high as 1200 deg. F.

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or silver brazing for joining this material.

Any of the atmospheres previously mentioned are applicable to brazing cast iron. Exogas, which is sufficiently reducing to give bright work with steel, will serve as well for cast iron. Since it is the cheapest gas, it is the atmosphere of choice. In addition, the decarburizing effect which this atmosphere has upon cast iron is itself of some value in improving wetting during copper brazing.

Temperature Controlled — Cemented carbides and cast alloys are frequently brazed to other materials. In many instances it is advantageous to employ the furnace brazing process. A reasonably dry hydrogen atmosphere, say +10° C (+ 50° F), will give excellent wetting on tungsten carbide provided the carbide is free of any oxide skin. In brazing Stellite type materials, a dew point sufficient to prevent oxidation of the chromium is necessary. This means −35° C to −40° C (−31° F to −40° F. This material and alloys such as Tantung which cannot be heated above a maximum of 850° C to 900° C (1562° F to 1652° F) can be silver brazed by the furnace technique using flux to dissolve the chromium oxide.

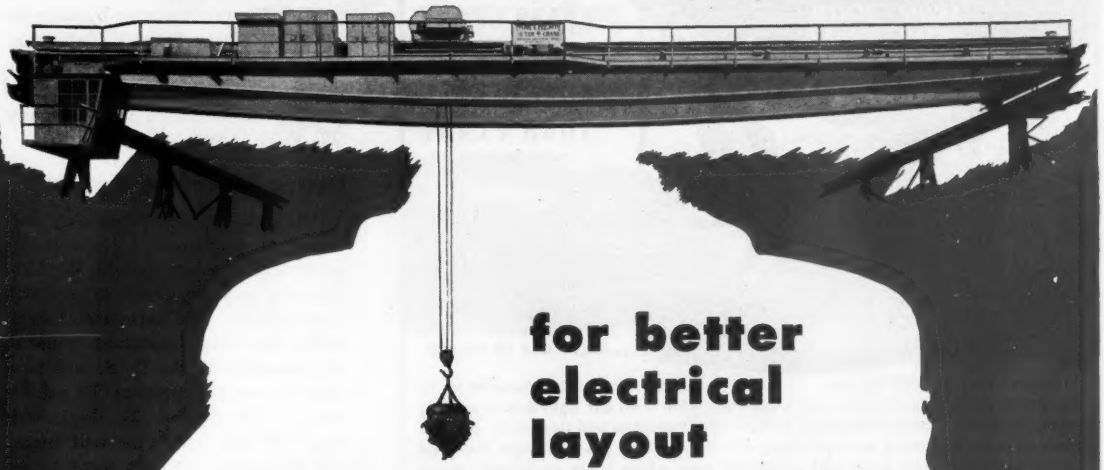
Uniform heating achieved in the furnace results in very clean filleting and uniform wetting of the surface of the cast alloy. In addition, in the case of the Tantung, careful control of the temperature to prevent overheating is readily achieved.

To maintain the low dew point required for brazing the Stellite materials, an ammogas furnace is required. On the other hand, silver brazing these materials using a flux will not require extremely dry hydrogen so that a box-type furnace can be employed.

Case Hardening Tips Published

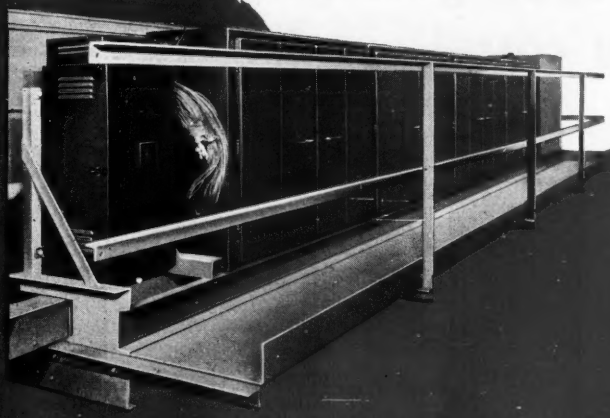
Idea book available to industry describes 36 specific cases in which manufacturers used case hardening to cut production costs, save steel and prolong tool and part life. Illustrated booklet contains eight case hardening hints to help overcome common hardening problems. In addition, a chart shows

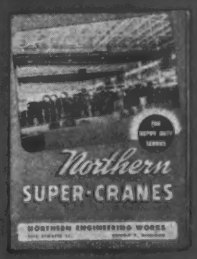
Northern Cranes



for better electrical layout

- Magnetic control panels mounted on a common support and wired as a unit greatly simplifies crane assembly, accessibility and maintenance.
- All wires, where possible, contained in metal raceways having movable covers.
- All Northern Cranes are completely wired at factory with solderless connectors, to eliminate the usual field soldering.
- Unit-welded steel construction, heavy duty roller bearings, transmission gear reductions, minimized wear on moving parts, easy accessibility, quick lubrication, simplified maintenance, and many other features reflect our experience of over 50 years in crane engineering and manufacture.





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Only *KRANE KAR* can do such difficult materials-handling jobs *ECONOMICALLY* because 1—it transports full rated load; 2—tops and lowers boom by power; 3—lowers load by power; 4—has automatic crane braking at limit positions; 5—has good vision; 6—excellent traction and short turning radius; 7—gas-powered, it can work 24 hours a day.

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Call a Gerrard engineer for detailed information about how the Gerrard Method of Strapping can help you cut shipping costs, speed up production line tying, eliminate unnecessary containers or give stronger reinforcement to cartons, boxes, crates and pallets. Write for a free copy of the *Blue Book of Packaging.*

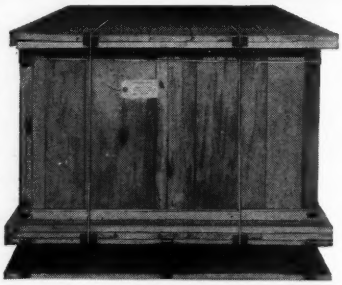

Photo courtesy of International Harvester Company, Industrial Power Division.

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proper temperature ranges for heat treating the types of steel in common use today.

Doughty Laboratories Inc., the publisher, makes a step-by-step description of its Hard-N-Tuff process, a method designed for operation without special equipment. To get copies, write to the company, 500 Fifth Ave., New York 36.

Electric Power Boom Forecast

"Nationally, electric-energy consumption continues to double approximately every decade. We have recently made a study of generating-capacity, and estimate that by 1965 the total installed generating capacity in the U. S. will have risen from the present 75 million kw to 178 million. To do this in the next 13 years, we will install 1⅛ times the present total capacity, which will give us three times the installed capacity of 1948 and four times that of 1942."

So said A. C. Monteith, vice president in charge of engineering, Westinghouse Electric Corp., Pittsburgh, in his address before the Southeastern Electric Exchange. Mr. Monteith highlighted developments in generators, transformers, shipping facilities, high voltage transmission, etc. He also cited future plans for increased research in the industry. For example, Westinghouse plans call for $75 million to be spent this year on research and development.

The speaker holds nuclear energy to be a certainty as a future power source. He recommends that the power industry become thoroughly familiar with the development of this energy and its applications in electric power generation.

Power Capacity Boosted

Expansion program amounting to $15 million is planned by California Electric Power Co., Riverside, Calif. Albert Cage, president, says demand for additional power has arisen in the company's service area because of new housing, increased needs of essential industries and agricultural customers, and expansion and reactivation of military bases. Power is supplied to southern California and western Nevada.

To supply the increase, the company is erecting its first large

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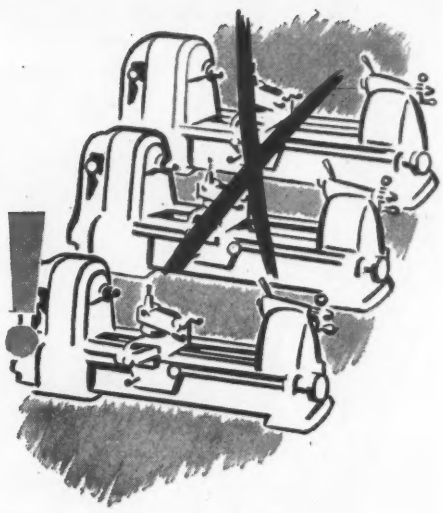

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with 263 sizes of . . . completely machined tubular and solid bronze bars.

Hundreds of different sizes of Bunting Bronze bearings and bars make it easy to select a size that fits the job.

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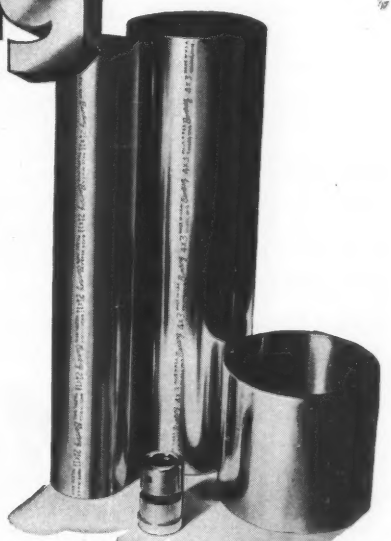

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509 S. Byrkit St., Mishawaka 5, Ind.

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST CLEANING EQUIPMENT

steam plant at Highgrove, Calif. New power equipment includes three steam turbines manufactured by General Electric Co., Schenectady, N. Y. First of the three has already been shipped. It is rated at 30,000 kw, and should be operating this month.

The other two turbines are rated at 30,000 and 40,000 kw and will boost the total capacity by 100,000 kw.

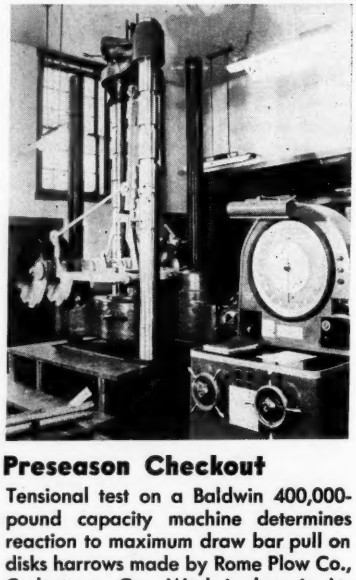
Correlating Test-Service Data

Relationship between service life of metals and their behavior in tests was discussed recently by H. J. French before the New York chapter, American Society for Metals.

In his talk, "Correlation of Tests with Service Performance," Mr. French points out the many different purposes served by metals. For example, he said, they may provide desired magnetic, nonmagnetic, electric, expansion or other physical properties. In these fields, laboratory tests usually determine directly the properties of interest.

This means problems of correlation are generally less important or nonexistent.

The speaker adds, however, that in metals applications several clas-



Preseason Checkout

Tensional test on a Baldwin 400,000-pound capacity machine determines reaction to maximum draw bar pull on disks harrows made by Rome Plow Co., Cedartown, Ga. Work is done in Atlantic Steel Co.'s laboratory where facilities are offered to customers on a noncommercial basis when they have no equivalent equipment available

sifications of use are shown where environments are not sufficiently precise or are so complex that testing procedures selected may introduce questions of correlation. This, he says, is especially true in applications made to combat destructive actions of mechanical stress, corrosion and erosion, abrasion and wear, high and low temperatures.

Mr. French, vice president of International Nickel Co. Inc., concludes that it is impossible to expect positive general data from a single determination, because results usually offer only limited information. As an example, he cites a hardness test that indicates little more than load-carrying ability for given series of alloys.

Dump Has Planetary Drive Axle

Heavy-duty dump truck with planetary-type drive axle is in production at the Sterling Division plant of White Motor Co., Milwaukee, for use by the Air Force. This special off-highway dumper, with 15-ton capacity, is the latest model built by the division for military assignment.

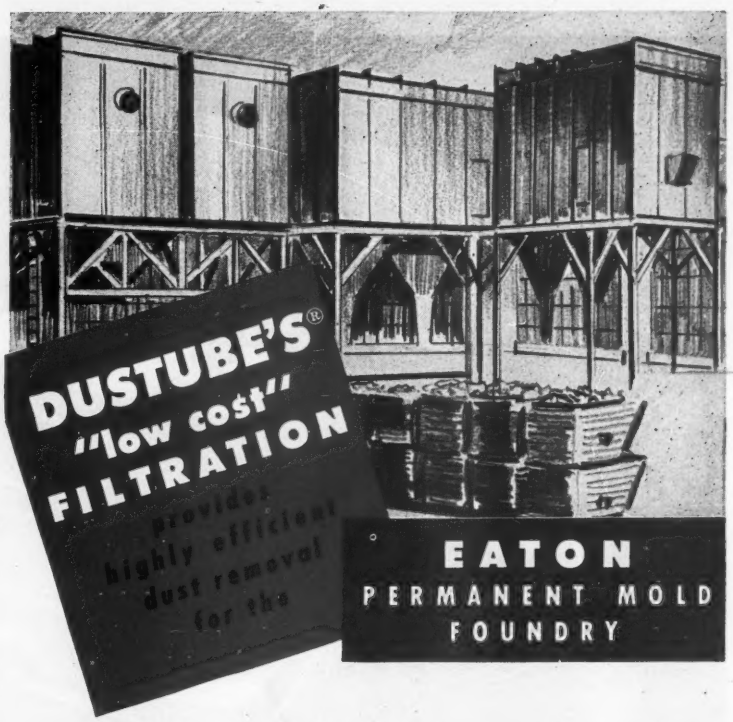
Planetary-type drive rear axle, with the company's differential model, divides power delivered to each rear wheel according to amount of traction existing between tire and road surface. Chassis is powered by a 250-hp engine. Transmission is ten-speed type, resulting in a wide selection of gear ratios to meet varied operating conditions. Hydraulic power-actuated steering gear gains maneuverability and operating ease.

Capacity is about 15 tons; rock-type body has water level capacity of 10 cu yd. Hydraulic dual telescopic hoist has high dumping angle to permit clean, rapid load discharge.

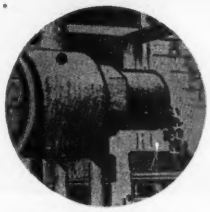
Weight-Measure Laws to Date

Compilation of laws governing weights and measures, superseding three earlier volumes, is announced by National Bureau of Standards. Information is presented in a single volume, comprising an up-to-date compendium of federal and state regulatory material.

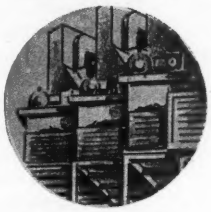
Comprehensive topical index of the entire volume, plus separate detailed tables of contents for laws of each state and federal regula-



Grinding



Rotating Mill



Blast Cleaning

ALL foundry cleaning operations of the world's largest producer of permanent mold gray iron castings, the Eaton Manufacturing Company, Vassar, Michigan, are ventilated by eight Dustube Collectors. According to Mr. Edward C. Hoenicke, General Manager of the Foundry Division, they are "pleased with the low cost operation and high efficiency of the Dustubes and are very proud of the cleanliness of our cleaning department."

Equipment ventilated includes seven Wheelabrator Tumblasts, a complete grinding room with both snag grinders and end grinders, tumbling mills, and a large continuous rotating mill.

Dustube's high efficiency and low cost operation are a result of its simple, effective design. There are no abrading metal parts to damage the cloth tubes. The perfected method of shaking the tubes removes as much of the accumulated dust as is commensurate with collection efficiency and resistance requirements. Inspection and necessary lubrication are readily and safely made on the clean air side of the collector.

Let Dustube engineers show you how you can eliminate the dust problem in your foundry at low cost. Write today for full details.

American® dustube® COLLECTORS

WHEELABRATOR & EQUIPMENT CORP.

509 S. Byrkit St., Mishawaka 5, Ind.

CASE NO. 21 WHEELDEX CARD INDEX FILE

A switch to aluminum tubing *slashed 60% from the cost* of the base for this Wheeldex "Circle Base Cub" card index file.

Another metal was formerly used in this Wheeldex model. Approximately 2,000 pounds made only 3,000 bases. A wise switch to aluminum and now—2,000 pounds makes 9,000 bases, *3 times as many!*

Thus aluminum greatly reduces raw material cost per base unit. Furthermore, the former metal required buffing and chrome plating. By anodizing aluminum after a bright dip, these time-consuming, cost-building plating operations are completely eliminated! Sales figures show the beautiful anodized aluminum finish is proving highly effective in increasing eye-appeal and buy-appeal . . . and at a much lower cost! Add to these benefits, the fact that aluminum tubing is easier to form and you have another important "plus" for aluminum.

This proof of performance with aluminum as illustrated in the progressive design thinking of Wheeldex Manufacturing Company, White Plains, New York, may suggest a similar conversion from other material to aluminum in your operation. Dollar savings plus high corrosion resistance, bright, long-lasting finishes are yours with aluminum.

LET ALUMINUM SERVE YOU, TOO

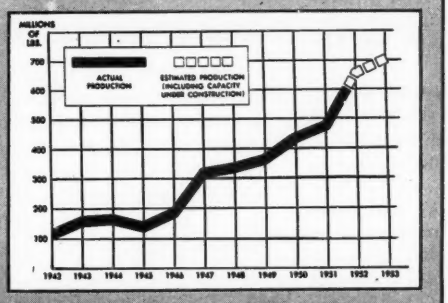
ALUMINUM?

...because it has an ideal combination of advantages found in no other metals!

More aluminum is being specified in designs today because aluminum improves products and increases sales. Let Reynolds Aluminum Specialists help your designers and engineers get maximum benefits from this modern metal. Remember, only aluminum gives you . . .

- ★ **Lightweight with great strength**
- ★ **Consistently low cost**
  (now less than before World War II)
- ★ **Natural resistance to rust and corrosion**
- ★ **Ease of fabrication by modern methods**

STILL MORE ALUMINUM COMING



The expanding primary aluminum production of Reynolds Metals Company . . . a historic chapter in the company's 33 years of continuing growth. And primary supplies of aluminum ore are ample for generations.

To the man in charge of production

Acquaint yourself with accepted techniques for fabricating aluminum. Write on your letterhead for aluminum fabrication books listed at right. On special problems consult with Reynolds staff of aluminum specialists. Reynolds Metals Company, 2520 South Third Street, Louisville 1, Kentucky.

Yours For The Asking . . .

REYNOLDS TECHNICAL BOOKS

(please request on business letterhead)

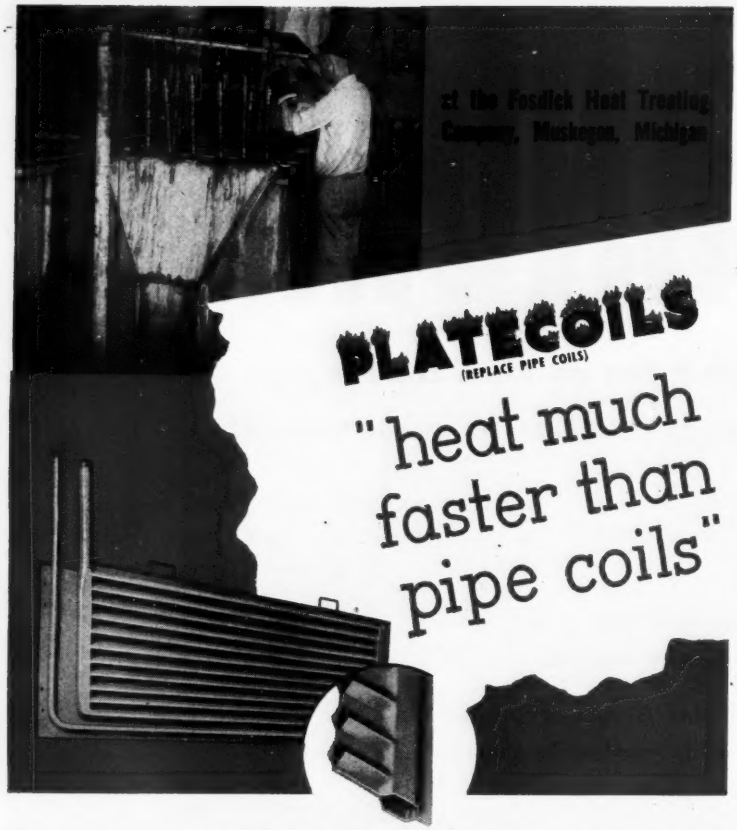
- A-B-C's of Aluminum
  (from mine to finished products)
- Aluminum Data Book
  (Aluminum Alloys and Mill Products)
- Aluminum Structural Design
- Designing with Aluminum
- Extrusions
- Fastening Methods for Aluminum
- Finishes for Aluminum
- Forming Aluminum
  (available about June 1)
- Welding Aluminum
- Machining Aluminum Alloys
- Heat Treating Aluminum Alloys
- Metals Weight Slide Rule

Ask for a complete index of technical literature and films covering all phases of aluminum design and fabrication.

REYNOLDS ALUMINUM

REYNOLDS METALS

MODERN DESIGN HAS ALUMINUM IN MIND

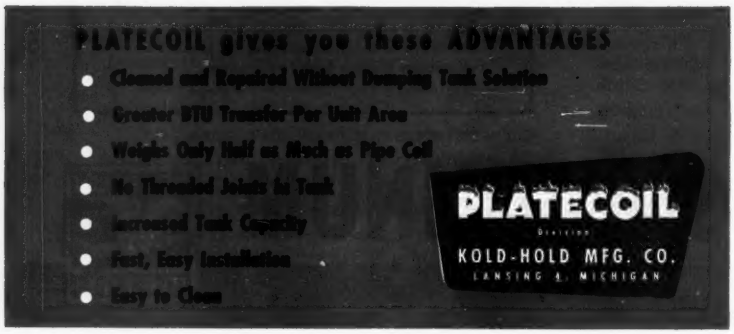


When Earl Fosdick, President of Fosdick Heat Treating Company, heard about the advantages of Platecoils, he wanted to try them in such a hurry that he flew to the Factory and picked up his first unit. This first Platecoil proved so satisfactory that he ordered a second unit SHIPPED AIR EXPRESS.

Each Platecoil heats a copper plating tank used in the heat treating of cam shafts for diesel engines. The Platecoils heat much faster than the pipe coils they replaced, so it's possible to start plating much earlier on Monday morning after the week-end shut down. In addition, the Platecoils require less space in the tanks giving them more plating capacity.

Platecoils heat faster than the pipe coils because they have more prime surface in a given area. A 22" x 47" Platecoil has the same heat transfer surface as 32 feet of 1½" pipe which occupies approximately 30" x 60" of space. This means better than 50% savings in space and material, and results in a lower initial cost.

Platecoils' faster heating coupled with their unusually low maintenance costs provide savings that are too great to be ignored. It costs nothing to see what Platecoils will do for you. *Airmail your request today for your copy of bulletin No. P72.*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Cleaned and Repaired Without Dumping Tank Solution
Greater BTU Transfer Per Unit Area
Weighs Only Half as Much as Pipe Coil
No Threaded Joints in Tank
Increased Tank Capacity
Fast, Easy Installation
Easy to Clean
PLATECOIL
Division
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tions can locate quickly provisions of each jurisdiction. Introduction includes an account of congressional action that has resulted in uniformity of U. S. standards.

"Federal and State Weights and Measures Laws," 1182 pages, sells for $5.75 and can be obtained from Government Printing Office, Washington 25.

How to Make Fine Parts Finer

Electronic components manufacturers will hear steps that may make their products more reliable when industry and government men meet May 5-7 to review this field. About 40 technical papers stressing new parts, materials and fabricating techniques are scheduled for the three-day session in Department of Interior auditorium, Washington.

Sponsors are American Institute of Electrical Engineers, Radio-Television Manufacturers Association and Institute of Radio Engineers. Active support is offered by National Bureau of Standards and U. S. Department of Defense. A. F. Murray, electronics consultant to the latter department's Research & Development Board, directed arrangements for the program.

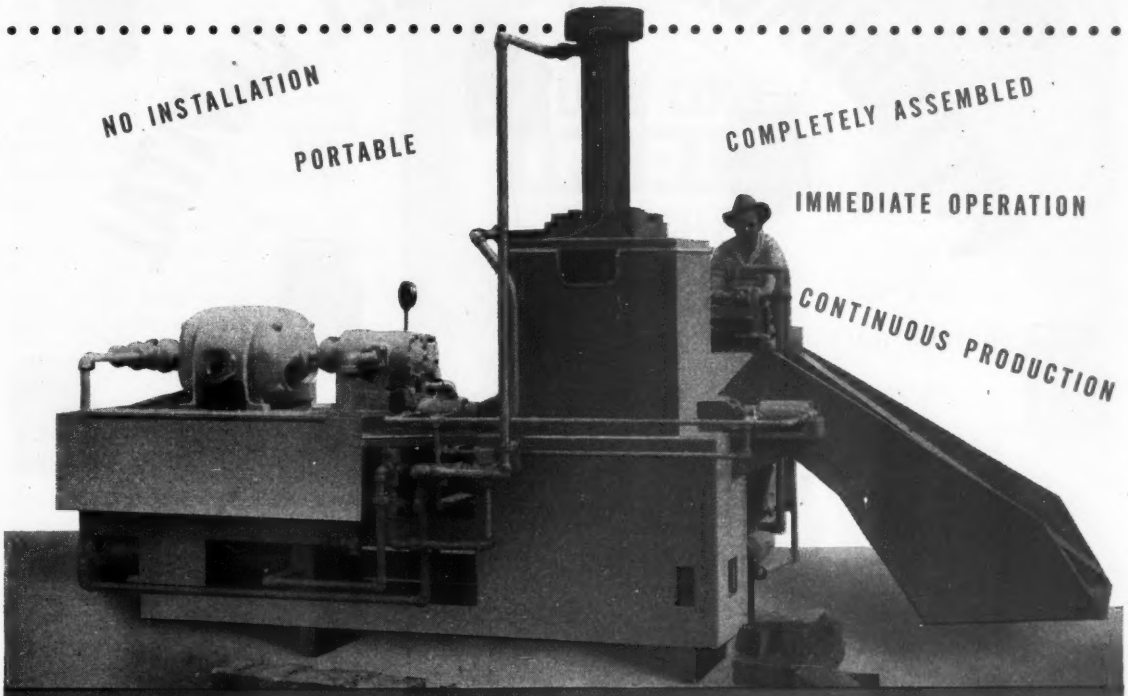
Integral Panel Heats Ovens

Completely integrated radiant heating for industrial baking and drying at 650°F or less is a development of Jensen Specialties Inc., Detroit. Oven employs 2000-w General Electric Calrod heaters and is made in a complete panel, including tubular heating elements, reflectors and insulation, with plug-in receptacle and pantograph mounting features.

Heater panels are designed to be freely interchangeable. They enable the manufacturer to build units of any length, size or rating and to change ratings of finished ovens at will. Jensen reports one result of installing the tubular units is greater concentration of heat per unit area. Pay load heating figure often hits 18,000 degree-pounds per kw.

Heater panels can be opened and serviced from outside the oven. This permits users to replace an element during operation in about 1 minute. Receptacles are non-

Harris Non-Ferrous Metals Baling Presses

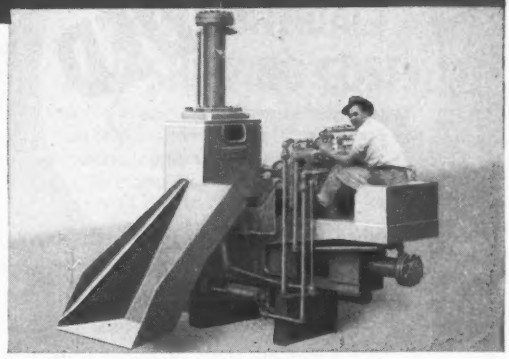


Bundle Size Attracts Dealers and Smelters

The HARRIS Non-Ferrous Metals Baling Presses were designed primarily for use in baling non-ferrous scrap. A particular feature of this design is that continuous baling is obtained, since the charging box is open while the bale is being made and ejected. The charging box is large enough to handle bulky material such as wire, sheets, etc. Pressures used make an exceptionally dense bale—approximately 40% density.

Dealers find these presses excellent also for baling sheet iron clippings and tin cans. The size and density of bundles are especially attractive for charging in electric furnaces.

The three models of this design provide an ample range to meet all requirements.

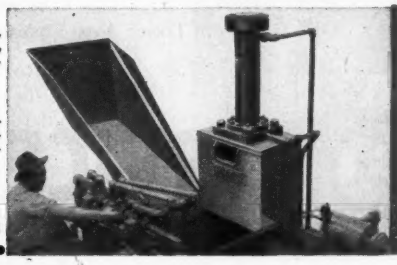


Size of Charging Box	33" x 33" x 24"	Vickers Vane Type Rotary Pump	2,000 lbs. per sq. in.
Average number of bales per hour	60 - 70	Space Required	10' x 12'
Size of Electric Motor	50-Hp. 1200 Rpm	Shipping Weight	20,000 lbs. (approx.)

AVERAGE SIZE OF FINISHED BALE
NF-40.....5" x 5" x 15"
NF-50.....5" x 7" x 15"
NF-80.....8" x 8" x 15"

AVERAGE WEIGHT OF BALE
NF-40 .....40-60 lbs.
NF-50 .....50-70 lbs.
NF-80 .....80-100 lbs.

AVERAGE TONNAGE PER HOUR
NF-40 One and one-half tons
NF-50 Two tons
NF-80 Two and one-half tons



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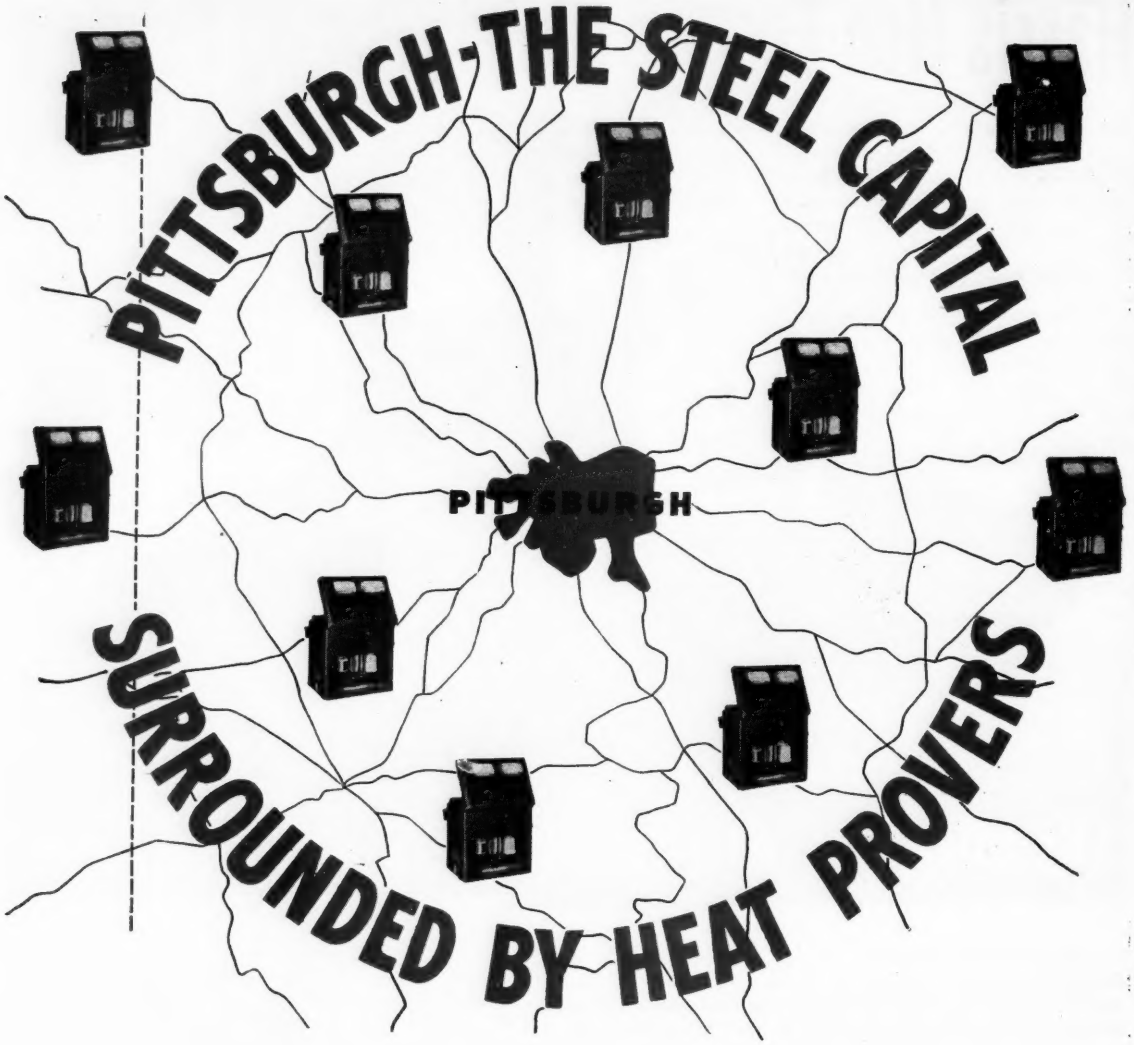
Reclamation Engineers Since 1889
CORDELE, GEORGIA



When your eye is on Pittsburgh—and three dozen towns in its orbit—you're spotting scores of furnace operations regularly checked by Cities Service Heat Provers. Here, where they know all kinds of furnace instruments, and where high efficiency is most urgent today, the application of Heat Provers by Cities Service is increasingly valued.

It takes the Heat Prover to read simultaneously for oxygen and combustibles, measured direct by actual gas analysis. And the Heat Prover's continuous rapid sampling reveals effects of furnace adjustments at once. The Heat Prover frees you of maintenance too, because it's *not an instrument you buy, but a Service we supply.* Learn how it can raise productivity for you . . . in iron, steel, ceramics, glass, cement or any other furnace operation. Write CITIES SERVICE OIL COMPANY, Dept. E24, Sixty Wall Tower, New York City 5.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

fragile and have average life in excess of 7000 hours. Units attain full heat in 2½ minutes; cool in 50 seconds to a temperature too low to burn paper.

Turbo-Hearth May Aid the South

U. S. Steel Co. is experimenting with a new type of steelmaking process that may have a highly beneficial effect on the Birmingham steel industry.

Dr. John B. Austin, director of research at the company's Kearney, N. J., research laboratory, reports work done with a turbo-hearth shows promise of refining steel in 10 minutes—and in a quality comparable with that produced after 10 hours in a conventional open hearth.

Speaking at the Southern Research Institute's symposium on research, Dr. Austin predicted that if the turbo-hearth proves practical and economical, as is now indicated, it will be especially advantageous for use with ores high in phosphorus. This is the type available in the Birmingham district.

Other experiments are underway by the company that may also influence Birmingham steel production, Dr. Austin said. These deal with studies of economical concentration of low grade ores, such as the large quantities found in that district.

Supplementing low grade ores with high-grade foreign imports is the most feasible method of achieving maximum steel production in the South, the speaker said. He added, however, that national security demands preparations be made for the time when such foreign materials may not be available. Therefore, the steel producer is continuing its long research program for a low-cost means of concentrating the iron-rich constituents of lean ore.

Ceramic Coating Goes Civilian

Ceramic coatings for metals, developed primarily to save strategic materials in defense production, are finding a variety of uses in civilian processes. Among industrial applications of parts coated with Solaramic, made by Solar Aircraft Co., San Diego, Calif., are automotive

LOW COST
IRIDITE®
FINISHES

for zinc, cadmium, aluminum and cuprous metals

provide corrosion resistance
paint base
choice of appearance

And they are easy to apply! Just a simple chemical dip for only a few seconds produces the coating.

LOW MATERIAL AND SHIPPING COSTS

combine to make Iridite the most economical chromate finish you can buy. Many Iridite chemicals are packed in powder form, thus can be shipped to you in steel pails at freight savings of up to 75%! Pails take less storage space, are easier to handle, eliminate carboys, need not be returned.

WHY NOT TEST IRIDITE ON YOUR PRODUCTS? Write for literature and send samples for free test processing. See "Plating Supplies" in your classified telephone directory or write direct.

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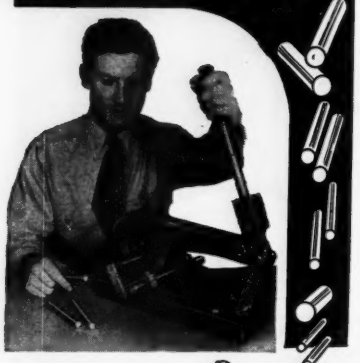
Precision
ROD CUTTING



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The DI-ACRO Rod Parters further increase the applications of "DIE-LESS DUPLICATING" as a cost cutting, time-saving production technique.

Do you require precision? — DI-ACRO Rod Parters hold tolerance to .001" on duplicated cuts. The ends are square, and roundness is maintained.

Do you want speed?—The Rod Parters exceed outputs of other methods with equal accuracy, on rods and bars up to 5/8". Torrington Roller bearings incorporated in an exclusive multiple lever-age arrangement provide remarkable ease of operation.

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Please send 40 page catalog including "Die-Less Duplicating" Engineering Service Offer.

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valves, petroleum refining equipment, unit heater components, oil burner parts and thermocouple components.

Coatings are said to conserve scarce materials in two ways: They make alloy parts rich in strategic elements last longer when subjected to high temperatures; and they allow the more easily obtainable steel to be substituted for hard-to-get higher alloys without cutting the useable life of the item.

Monorail Set for Heavy Duty

Successful application of overhead monorail cable conveyor systems to heavy duty, as well as lightweight materals handling purposes, is reported by Daigle-Gaboury Inc., Detroit. Use of 9/16-inch steel core cable in joining trolley brackets is accomplished with complete satisfaction, according to the firm's engineers.

Cable passes through the sleeves of the split bracket. The sleeves have internal serrations. Externally, they are tapered and threaded. When the cable is enveloped by the bracket sleeves, the halves of the split nut are brought together on the sleeve and turned on the expanding threads of the taper. In this way the nut exerts a 360-degree compression on the sleeve causing it to establish a biting hold on the cable with its internal serrations. Company says that in this fixed position on the cable, trolley brackets withstand loads up to 10,-800 pounds without indications of slipping.

Literature and technical data on the system can be obtained by writing to the manufacturer, 20175 John Rd., Detroit 3.

Rebuilt Spray Service Planned

Inauguration of a new service plan is announced by the DeVilbiss Co., Toledo, O., manufacturers of spray finishing systems. Known as their "rebuilt exchange program," it makes the company's exchange equipment available for immediate delivery to users having DeVilbiss products for rebuilding.

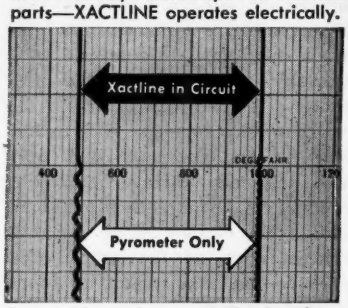
Units are completely rebuilt by factory trained technicians and carry the same guarantee as new units. At first exchanges will be

Automatic
"STRAIGHT-LINE"
TEMPERATURE CONTROL
with
XACTLINE

ELIMINATE
Overshooting
Undershooting

Are you going to continue to put up with that troublesome overshooting and undershooting inherent in your conventional pyrometer control—especially when it is so easy to eliminate that saw-tooth effect?

Put XACTLINE in the control circuit. XACTLINE anticipates the temperature changes—before they occur. And too, it nullifies the varying amounts of thermal lag, residual heat, and mechanical lag—producing a short on-off cycle resulting in "Straight-Line" temperature control. This performance is possible because there is no dependence upon mechanical parts—XACTLINE operates electrically.



Exact reproduction of temperature chart for a heating process showing the comparison of the "Straight-Line" temperature control produced by XACTLINE and the saw-tooth curve obtained with only conventional control.

XACTLINE is applicable to any indicating or recording pyrometer control of the millivoltmeter or potentiometer type. It should be used wherever close temperature control is required—any type of electrically heated oven, furnace, kiln, injection molding machine, and fuel-fired furnaces equipped with motor-operated or solenoid valves.

XACTLINE is a complete unit. No adjustment or coordination with the control instrument is required regardless of the size of the furnace, length of the heating cycle, or size of the load. Installation is very simple—can be either flush or surface mounted.

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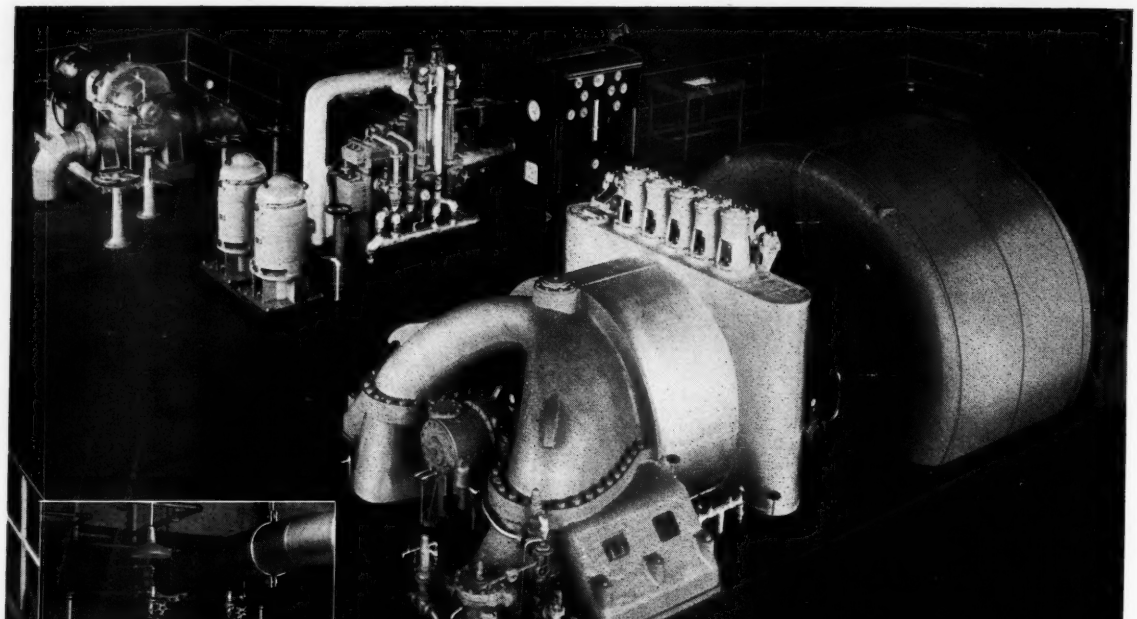
build the performance of copper into your products
save up to 80% of critical copper or brass

SuVeneer® CLAD METALS

SuVeneer Clad Metals give you *solid copper or brass surfaces* on a core of strip steel. The product is bonded inseparably, *stronger* than either copper or brass alone, providing every advantage of the dense, solid, impermeable non-ferrous metals on one or both sides of the steel.

Use SuVeneer Clad Metals as you would any coiled strip—improve your products, and save money! ● Complete details on request.

Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA



UNDIVIDED RESPONSIBILITY pays off

in Blast Furnace Blower Service

Pictured above is an Ingersoll-Rand Blast Furnace Blower Installation.

Including:

BLOWER... 100,000 cfm of air at 30 psig.

TURBINE... 11,150 hp... condensing.

CONDENSER... Two-pass, 11,000 sq ft of cooling surface... vertically divided for cleaning.

STEAM-JET AIR EJECTOR... Twin element, 2-stage... mounted on Surface Inter-and-After-Condensers.

CONDENSATE PUMPS (2)... 8-stage vertical.. rated 275 gpm, 300 ft head at 1450 rpm.

CIRCULATING-WATER PUMPS (2)... Single-stage double-suction... rated 6,000 gpm, 30 ft head at 480 rpm.

Combustion Air to the Blast Furnace! That's the purpose of a Blast Furnace Blower. But other equipment is necessary to serve the blower... a turbine to drive the blower... a condenser to serve the turbine... air ejectors, condensate-return pumps and circulating-water pumps to serve the condenser.

Ingersoll-Rand makes ALL of this equipment. The I-R Turbo-Blower installation is built and designed as a unit. One manufacturer means matched, allied equipment and **UNDIVIDED RESPONSIBILITY.**

When you think of Blast Furnace Blowers, remember Ingersoll-Rand and **UNDIVIDED RESPONSIBILITY.**

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Research: Key to Metal's Future

Importance of technological progress to American metalworking was illustrated clearly for about 450 engineers, designers and production men who attended Boston Chamber of Commerce's Research Day, Apr. 18.

Speakers pitched their talks to a single chord: Second half of this century will bring tremendous changes involving application of new metals, until recently relatively unknown. These are the tools U. S. industry must use to keep pace with expanded needs.

Key Steps—Richard C. Morse, president, National Research Corp., Cambridge, Mass., amplifies this theme by citing key steps made in metals by his company. As a result, progress is shown in industrial acceptance of many materials, including pure molybdenum, the rare earths, zirconium, titanium and lithium. Mr. Morse emphasizes the need for more work to overcome restrictions of cost, lack of availability and problems of application.

Use of molybdenum, with melting point of 4700°F, in applications where strength is required for high temperatures has long baffled engineers. In pure form this metal is difficult to cast because of its high melting point. In addition, it will burn if exposed to air when used at high temperatures. Research has made casting and melting possible, while life is increased by alloying and protective coatings. National Research Corp. reports a coating process that permits use of pure molybdenum for several days at 2000°F.

Other projects outlined by Mr. Morse indicate progress in techniques for melting and casting titanium, aluminum, nickel, iron and many alloys. Extremely pure metals or alloys of controlled composition are produced without usual dissolved gasses. Development in vacuum melting by the research firm results in production of a gas-free high-purity bearing steel with

● A special fastener often can improve product design and performance while cutting production costs. When you specify a Buffalo Bolt "Special"... you can be sure it is designed for the job and made by the most modern methods to the highest standards.

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AT YOUR SERVICE

2 NEW Shenango bulletins

. . . on symmetrical or annular parts, ferrous and non-ferrous

IF your plans call for bushings, liners, sleeves, rings, rolls, or *any* essentially symmetrical shape, find out about the many advantages you stand to gain with Shenango centrifugally cast parts.

BULLETIN NO. 150 covers non-ferrous parts in manganese and aluminum bronzes, red bronzes, brass, Monel Metal and special alloys.

BULLETIN NO. 151 covers parts of Meehanite Metal, Ni-Resist and special iron alloys.

These new bulletins show typical Shenango produced parts that are saving time, trouble and cost in industries everywhere. Get the facts. Either or both bulletins are yours for the asking.

SHENANGO-PENN MOLD COMPANY
Centrifugal Castings Division
Dover, Ohio
Executive Offices: Pittsburgh, Pa.

SHENANGO
ALL RED BRONZES · MANGANESE BRONZES · ALUMINUM BRONZES
MONEL METAL · NI-RESIST · MEEHANITE® METAL

a triple increase in life over a standard aircraft bearing.

Casting to Form—Concept of pouring molten metal directly to close approximation of its final form rather than casting, rolling, cutting or fabricating, is receiving considerable attention through intensive research. Work on this process for the Navy and Air Force is headed by H. H. Harris, president, General Alloys Co., Boston.

Taking full advantage of metals made available by research, Joseph H. Quick, president, Harrington & Richardson Arms Co., Worcester, Mass., states revolvers and rifles are built now with barrels good for 150,000 rounds. About 15 years ago, 25,000 to 40,000 rounds was all that could be expected. Better steels, improved machining and design make this possible. Among 11 new products announced by the firm this year is an aluminum revolver, made of special aluminium alloy, an extremely lightweight weapon that is durable and accurate.

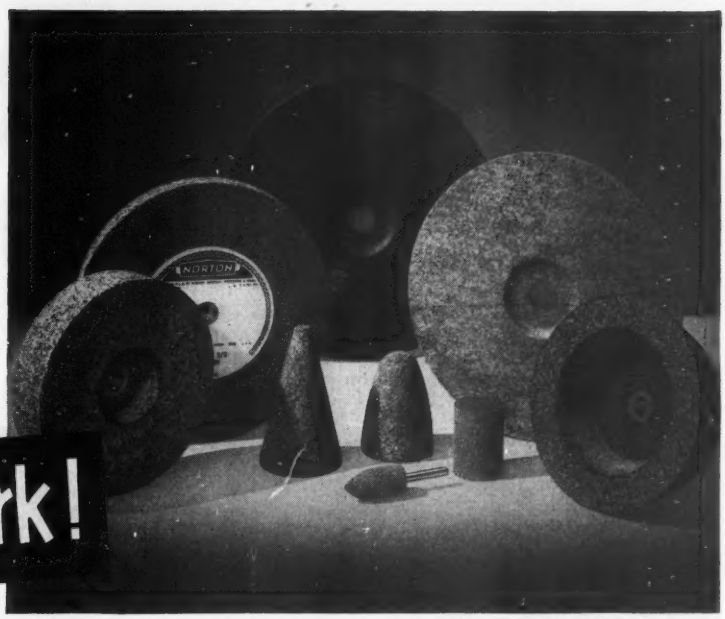
While aggressively pushing research programs for new products, Mr. Quick sounds a warning: Shops should also be prepared to produce competitively; otherwise, benefits of research can be lost.

Maintenance First—In this vein, Everett M. Hicks, vice president and manager, Grinding Machine Division, Norton Co., says his company's research organization functions to attain two major objectives. The first involves the important phase of maintenance or improving established products; the second, developing new projects. Research at Norton is a separate group reporting to top management. Within very broad limits, says Mr. Hicks, this organization is given complete freedom to determine projects for study.

Among successful ventures is high-speed firing in straight-line production of wheels up to 14 inches diameter, reducing annealing strain in the vitrified wheel almost to the vanishing point. Equally important, Mr. Hicks says, is development of controlled structure principle in manufacture, with precalculated volume of abrasive and pores molded into each wheel.

R. S. Reynolds Jr., president of

Norton Portable Grinding Wheels...



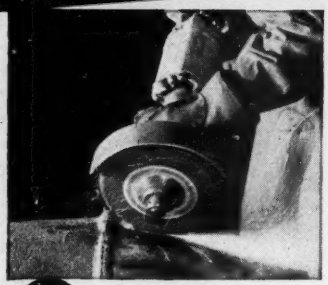
Hug That Work!

You get faster grinding, longer wheel life and less operator fatigue when you use Norton portable grinding wheels. *They hug that work!* Less vibration . . . less bounce!

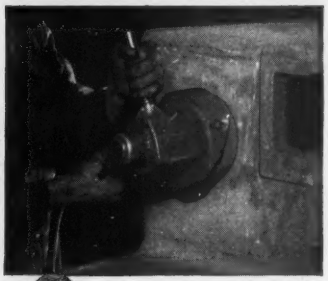
This more continuous contact with the work comes from the *controlled uniformity* and *built-in balance* which Norton process engineers have recently developed to a degree never before attained.

Ask your nearby Norton distributor about new, improved Norton portable grinding wheels. He's listed under "Grinding Wheels" in your classified telephone directory. Or write direct to Norton Company, Worcester 6, Mass. Distributors in all principal cities EXPORT: Norton Behr-Manning Overseas Inc., Worcester, Mass., New Rochelle, N. Y.

And Cut Costs *on portable grinding jobs like these:*



GRINDING A STEEL CASTING preparatory to machining is one of many jobs done best by Norton straight wheels. No other wheels *hug that work* so closely... remove so much metal per man-hour... last so long.



SURFACING A MACHINE BASE is typical of the tough jobs Norton cup wheels make easy. Fast-cutting and long-lasting, they do an extremely efficient job with a minimum of operator fatigue.

SMOOTHING DOWN WELDS is a quick, easy, safe job with both types of Norton REINFORCED Hub Wheels — the rigid BD and the flexible BFR. Made with a special resinoid-bond and layers of fabric reinforcement, they give you fast grinding, long wheel life, and maximum safety.

NORTON ABRASIVES

Making better products to make other products better

Announcing

For centralized control with greater flexibility

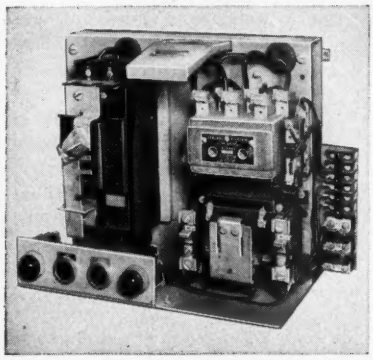
Here's an attractive, versatile new motor control center that you can easily plan, install, and service. Compact—a section is only 20 inches wide, 20 inches deep, and 90 inches high. It will accommodate NEMA Size 1 through 4 starter units back to back.

A four-inch wiring trough provides ample space for outgoing wires and cables. Starter units are designed for easy inspection and servicing.

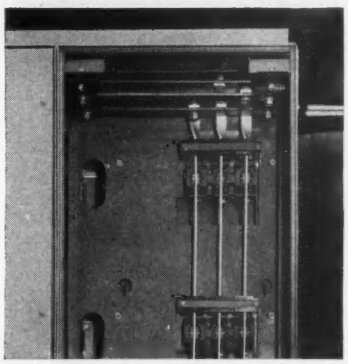
There are many provisions for protecting personnel from mechanical and electrical injury. This G-E motor control center has also been laboratory tested to assure protection against 25,000 amperes short-circuit current. More information on this new, modern motor control center in bulletin GEA-4979A. Write your nearest G-E office today. *General Electric Co., Schenectady, N. Y.*

THIS COMPACT, ATTRACTIVE, G-E MOTOR CONTROL CENTER provides the most modern method of controlling a-c motors up to 200 horsepower from a central location.

the NEW General Electric Motor Control Center

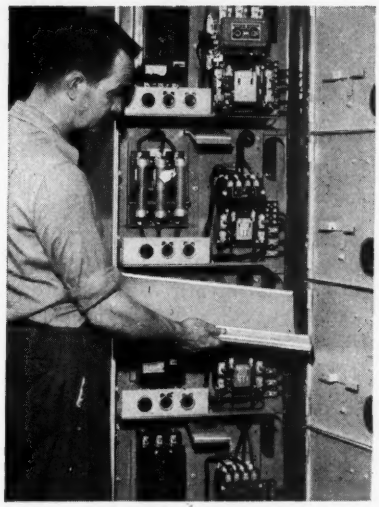


STARTER UNITS ARE COMPLETELY ACCESSIBLE. All components—even the pilot devices—are mounted on a sturdy frame with all terminals front connected.

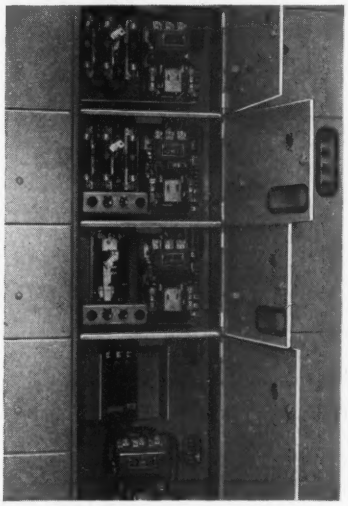


DESIGNED TO PROTECT PERSONNEL. Rear view shows metal barrier that separates starter unit space from bus bars. Vertical section features new "I-beam" construction for strength.

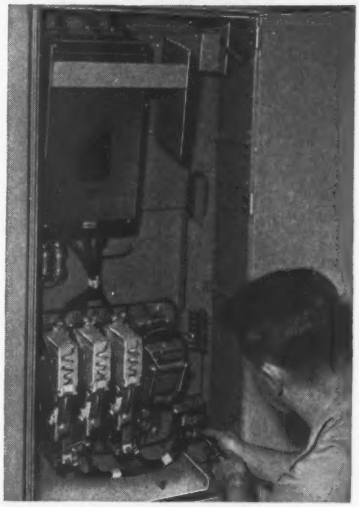
EASY TO INSTALL AND INSPECT. Sturdy, light-weight starter units are easy to handle, and interchangeable because of standardized dimensions and components.



EASY TO WIRE. Ample four-inch wiring trough is completely accessible by removing horizontal metal barriers between units. Barriers isolate and support units as they are slid into section.



VERSATILE. Starter unit sizes and types are in even multiples of 14 inches. Fusible and circuit breaker combinations of the same starter size are interchangeable without changing doors.



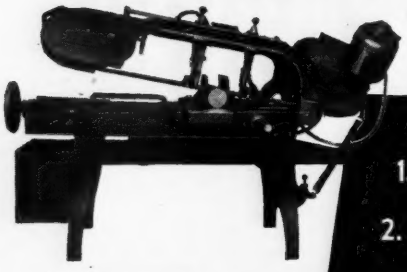
EASY TO SERVICE. Doors swing wide (no hinge wiring); unit is easily disconnected from bus and held in test position for protected servicing.

GENERAL ELECTRIC

730-31

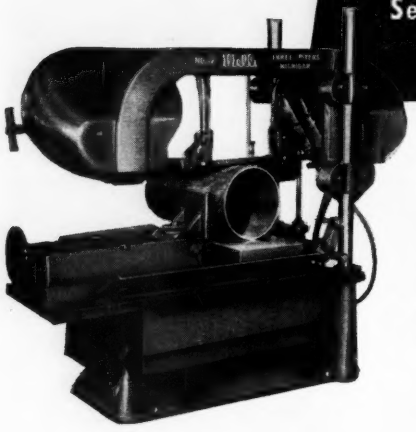
5 BIG REASONS

Why Wells Band Saws slash metal cut-off costs



1. Fast, Accurate Action
2. High Job Productivity
3. Low Operating Cost
4. Real Blade Efficiency
5. Long, Dependable Service

Above is the Wells No. 8, shown with wet cutting system. It offers a capacity of 8" x 18", rectangular, 8" dia., rounds. The No. 5 is similar but has a capacity of 5" x 10" rectangular, 5" dia., rounds.



Left is the Wells No. 12 which features an automatic cutting cycle and controlled blade pressure. It has a capacity of 12" x 16", rectangular, 12¾" dia., rounds. Die block capacity 12¾" deep, 16" wide, 18" clearance bed to blade.

YOU are always ahead when you handle your cut-off jobs on "Wellsaws." The Wells Band Sawing method will not only reduce your operating costs, but also give you greater job efficiency — better cuts, and real dependable service. There is a size and type for every need and every budget. Capacities range from 3½" x 6" to 48" x 48". All models are built for full duty and backed by over 25 years of band saw manufacturing experience.

Your Wells Distributor will be pleased to give you full information on models suited to your needs — or write for descriptive literature.

Wellsaws

Wells

The Pioneers of Horizontal

METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION
1515 FILLMORE ST., THREE RIVERS, MICHIGAN

Reynolds Metals Co. and moderator of one of the Research Day panels, traced his company's growth from a producer of metallic foil in 1919. Mr. Reynolds added that the choice between copper and aluminum basically is not a matter of competition, but one of normal technological considerations relating to cost and function.

Building Corrosion Studied

Resistance of sheet metal building materials to atmospheric corrosion is reported by the National Bureau of Standards in "Building Materials and Structures Report 128."

Tests of various metals and their corrosion resistivity were conducted. Report cites dangers of improper installation and possible steps to take to prevent corrosion. It states that premature deterioration of a material usually results from contacts with dissimilar metallic materials of construction or from proximity to nonmetallic materials. It is often impractical to avoid using materials that may accelerate corrosion of one or two materials when they are brought into intimate contact. Materials, however, can be insulated from each other by means of paints, mastics, waterproof papers, felts, etc., to minimize corrosion.

Copies are available from the government printing office, Washington 25, for 20 cents.

ASTE Moves in Tool Research

American Society of Tool Engineers met recently with directors of several research foundations to discuss ways of increasing tool engineering research to raise the nation's fund of production know-how.

Preliminary work on setting up an ASTE tool engineering research fund, to support basic metalworking research programs, began two years ago. The society has appropriated an initial $50,000 to set up the fund. Plans call for grants to research institutions, colleges and universities to further basic research in these fields.

Research foundations whose directors were invited to attend the initial meeting are: Armour Research Foundation, Illinois Insti-

photograph by d'Arazien

Our "*hidden service*" makes steel more useful to you

HOW do you discover the hidden qualities of a material as hard and dense as steel? Difficult as it may sound, there are ways you can ferret them out when you have a special service like Jones & Laughlin's Quality Control.

Some of our Quality Control methods are almost routine—chemical analyses, micrographs, fracture tests, Brinell hardness tests, tensile tests, impact tests. Others involve techniques and machinery that are intricate—having been designed for special purposes.

For example, this high-pressure hydrostatic tester is a precisely-engineered mechanism. It tests with water pressures up to 10,000 lbs. per sq. inch and will indicate in a few moments whether J & L oil country seamless steel casing or tubing will withstand the terrific pressures encountered in a deep oil well.

Our Quality Control technicians have many other valuable facilities at their command. That is your insurance that the steel behind the J&L trademark is of uniform quality and dependability.

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH 30, PA.

FARREL® GEAR DRIVES
fit your needs like a GLOVE

Farrel gear drives, pinion stands and combination units are built to suit your needs exactly.

You only have to list your drive requirements: power and speed . . . type and gauge of metal to be rolled . . . process (hot or cold) . . . nature of load (continuous or intermittent) . . . type of drive motor . . . etc. We will then do the rest, supplying you with a *designed-for-the-job* unit capable of withstanding the shocks, stresses and wear encountered in continuous, heavy-duty service.

Farrel rolling mill drives and pinion stands, separate or combination units, are available in any capacity. We shall be glad to supply full information for specific requirements.

FARREL-BIRMINGHAM COMPANY, INC. • ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Pittsburgh, Chicago, Los Angeles, Houston

Farrel-Birmingham®

A 1250 hp, 600 rpm double reduction unit combined with 26" two-high pinion stand.

B 10,000 hp piercing and expanding mill drive.

C 150 hp tube mill drive, triple reduction 113:1 ratio.

D 800 hp cold strip mill drive.

E 1500 hp reversing rod drive with cover removed.

tute of Technology; Ohio State University Research Foundation; Engineering Research Institute, University of Michigan; Battelle Memorial Insitute; and Purdue University Research Foundation. ASTE tool engineering research fund committee is chairmanned by Prof. Jay N. Edmondson, Purdue University.

Electric Locomotives Revived

Preliminary tests made with Ignitron rectifier locomotives indicate they may hasten a revival of interest in railroad electrification. So says W. A. Brecht, Westinghouse Electric Corp.

Mr. Brecht reported on progress made with the firm's electric units in a recent address to the New York Railroad Club. He cited as an example of their power an operating test in which one locomotive hauled 162 fully-loaded coal cars. The first two models were purchased by Pennsylvania Railroad, put through extensive road tests and are already in extensive freight service.

Difference between this type and its predecessors is use of Ignitron rectifier tubes to convert alternating current from overhead trolley lines to direct current drive. This system takes advantage of alternating current's easier and cheaper transmission, but retains operating and cost superiority offered by direct current for driving motors.

Speaker reports the 6000-hp, two-unit locomotive is 124 feet long, on six motored axles. It weighs 740,000 pounds. Tractive effort, or ability to pull loads is measured at 189,000 pounds. Dr. John A. Hutcheson, company vice president and director of research, outlined research phases of the development.

Handbook Covers Heavy Tools

Pocket-size handbook for users of heavy metalworking equipment is issued by Strom-Johnson Machinery Co., Chicago. Book contains a compilation of selected technical data pertinent to the industry, plus brief descriptive matter of the various types of metalworking machinery rebuilt and reconditioned for resale by the company.

Additional information gives a thumbnail sketch of the Strom-Johnson organization and its operations. For a free copy of the booklet write the company, 8800 S. Vincennes Ave., Chicago 20.

Safety in Acid Handling

Recommended practice for the handling and use of chromic acid is given in Chemical Safety Data Sheet SD-44, published by Manufacturing Chemists' Association Inc. The acid is classified as an oxidizing material and its power is intensified in the presence of other strong acids. Concentrated solutions at elevated temperatures attack common metals.

Data sheet lists important precautions that must be observed to protect personnel who handle the material. Proper methods for shipping, labeling, storing, unloading and emptying containers are described. Personal protective equipment, employee education and instructions for physical examination and medical treatment are also outlined.

Copies of the sheet may be ob-

Designed • Engineered • Manufactured by Cuyahoga!

TO IMPROVE ALL TYPES OF ASSEMBLIES...produced in any quantity...large production runs a specialty... Cuyahoga's designers and engineers stand ready to assist you in the design and application of custombuilt springs, parts, stampings, forms, assemblies or Snap-Clips made from either round or flat steel.

Contact your Cuyahoga representative or write direct.

Subsidiary of Barium Steel Corporation

The CUYAHOGA SPRING Co.

10200 BEREA ROAD • CLEVELAND 2, OHIO

take the "tension" out of your packing problem

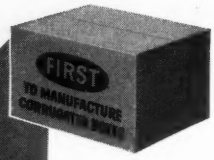
Protecting heavy products in shipment is no problem for H & D heavy-duty corrugated shipping boxes. They cut original container costs, reduce packing and freight costs, speed handling in all phases of distribution.

As many as 1700 springs—200 pounds—are packed in the heavy-duty corrugated box illustrated above. Boxes, with top and bottom cap construction, provide unusual strength for shipping heavy products. H & D heavy-duty boxes are easy to store, easy to pack, easy to handle, easy to warehouse and re-ship. For booklet, "How To Ship Heavy Products," write Hinde & Dauch, 5219 Decatur St., Sandusky, Ohio.

H&D®

HINDE & DAUCH

Authority on Packaging



Akron, Baltimore, Battle Creek, Mich., Bloomington, Ill., Buffalo, Chicago, Cincinnati, Cleveland, Columbus, Denver, Detroit, Fairfield, Conn., Findlay, Ohio, Gloucester City, N. J., Greensboro, N. C., Hoboken, Indianapolis, Jamestown, N. Y., Kansas City, Lenoir, N. C., Minneapolis, Omaha, Plymouth, Ind., Reading, Pa., Richmond, Va., Roanoke, Va., Rochester, Sandusky, Ohio, Shrewsbury, Mass., St. Louis, Toledo, Watertown, Mass.

tained for 25 cents from the association. Woodward Bldg., 15th and H Sts., Washington 5.

Plating Practices Summarized

"Practical Nickel Plating," a 44-page general publication with more than 40 illustrations, tables and charts, provides basic information on electroplating, plus a study of nickel plating and its practices. Keyed bibliography suggests 41 sources of additional reading for those who need greater detail or have special interests.

Information is included on the mechanical properties of deposits, plating conditions and commonly used solutions. Recommendations show preparation of basic metals, recognition and correction of plating difficulties and solution purification. Material also covers thickness and type of nickel deposit for adequate service life in many corrosion resistant, industrial and electroforming applications. Copies are available from International Nickel Co. Inc., Dept. EZ, 67 Wall St., New York 5.

Table Aids Metal Powder Users

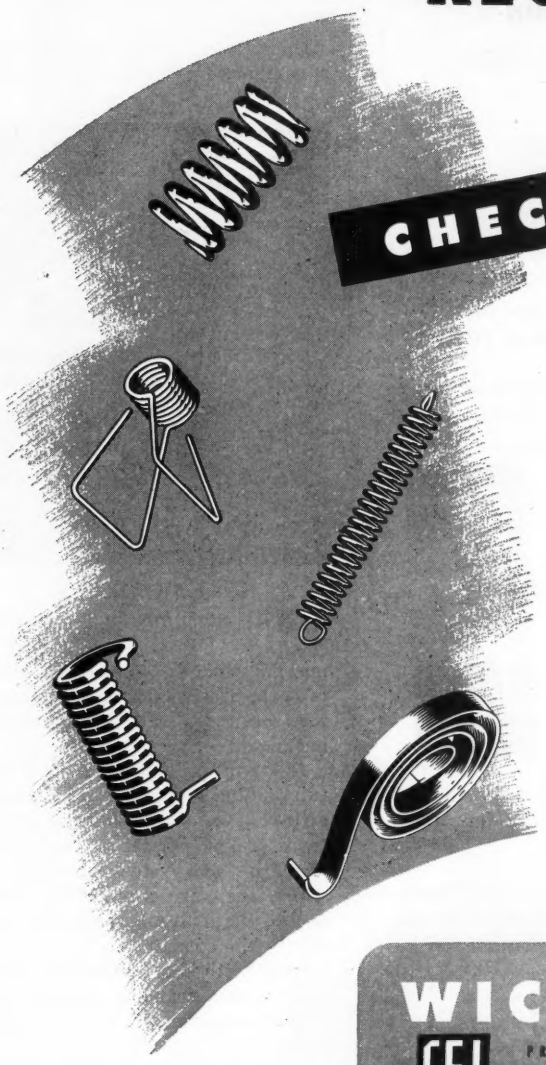
Users of metal powder bearings have available an interchangeable size table, compiled and published by Wel-Met Co., Kent, O., manufacturers of metal powder bearings and machine parts. This 4-page folder lists 133 Metal Powder Association standard self-lubricating bearing sizes, gives their inside and outside diameter and length dimensions, and shows corresponding part numbers for interchangeable bearings as produced by Wel-Met and five other American bearing manufacturers. Copies can be obtained free by writing to the company, 122 Gougler Ave., Kent, O.

Radiation Read on Single Scale

Development of a new and simplified wide-range radiation detector is announced by the Armour Research Foundation, Illinois Institute of Technology, Chicago. Developed by Leonard Reiffel, foundation nucleonics supervisor, the new instrument is immediately sensitive—on a single scale—to radiations varying from 1/10-milliroentgen to 1000 roentgens. This is a

WIRE

REQUIREMENTS?



CHECK WICKWIRE

We can meet your specifications for specialty steel wire of high or low carbon ... round or shaped ... in an extensive range of sizes, tempers, grades and finishes.

When you specify Wickwire Wire you can be sure of unvarying uniformity in quality, size, tensile strength and stiffness. That's because every step of its production, starting in our own blast furnaces is under constant and careful control ... subject to rigid testing and inspection.

It pays to remember: For the Wire You Require—Check First with *Wickwire.*

For additional information write or phone our nearest sales office.

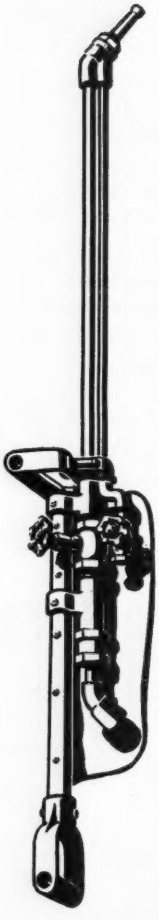
THE COLORADO FUEL & IRON CORPORATION, Denver, Colorado
THE CALIFORNIA WIRE CLOTH CORPORATION, Oakland, California
WICKWIRE SPENCER STEEL DIVISION, Atlanta • Boston • Buffalo
Chicago • Detroit • New York • Philadelphia

WICKWIRE WIRE

CF&I

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

HOW DO YOU CLEAN BIG METAL PARTS?
HOW DO YOU STRIP PAINT OFF THOSE LARGE STEEL SHEETS?
HOW DO YOU KEEP YOUR EQUIPMENT SO CLEAN?
I USE AN OAKITE STEAM GUN FOR ALL THE HARD JOBS. IT SAVES TIME AND MONEY



This happy man has found the answer to all the tough cleaning problems.

He knows the best way to clean metal parts that are too large to be soaked in tanks or conveyed through washing machines.

He knows the best way to strip paint from large parts and large surfaces that can't be soaked.

He knows the best way to clean large equipment such as:

die casting machines
wire drawing machines
blooming mill rollers and cutters
hoisting machinery
brass reduction machines
millers and grinders
buffing machines
forge hammer parts
drill presses
stamping machines
motors

He knows his Oakite Steam Gun will do practically every cleaning job that's too big or too difficult to do by ordinary methods.

FREE For your copy of "*Time saved with Oakite steam-detergent cleaning*" write to Oakite Products, Inc., 34E Rector St., New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

Technical Service Representatives in Principal Cities of U.S. & Canada

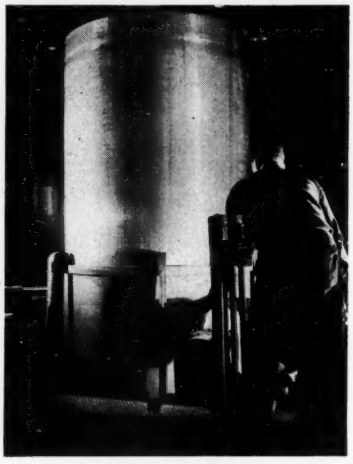
sensitivity ratio of 10 million to 1.

Explaining the value of the unit, Mr. Reiffel says that radiation sharply and suddenly increases as its source is approached. With this new detector, sudden changes will be indicated instantly on the scale, and persons will be warned quickly of dangerous sources.

GE Opens Pittsfield Addition

Three new buildings are completed and operating at General Electric Co.'s Transformer & Allied Products Division, Pittsfield, Mass. Francis E. Fairman Jr., division general manager, says the additions cost more than $6 million and provide 94,520 sq ft of floor space.

Operations include manufacture of laminated cylinders for insulating transformer coils, production of copper conductors for transformers and testing high voltage bushings.



HYDRAULIC STRIPPER
. . . less strain from push than pull

One unusual feature cited in the tube rolling building is a hydraulic stripper, used to remove completed transformer insulating cylinders from the heavy steel mandrels on which they are wound. Installation of the hydraulic assembly permitted the company to abandon its former method of pulling the mandrels with a crane, a practice that caused severe strain on the equipment.

Base for the stripping setup is sunk 28 feet below the floor surface.

How to reduce your costs with Pre-Coated Thomas Strip

Here's a profit-building idea for any light metals fabricator—combine the functional properties of non-ferrous metals with the utility and economy of cold-rolled strip steel by using *pre-coated* Thomas Strip to speed operations and cut costs.

In many instances with Thomas Strip, all you have to do is fabricate and assemble—expensive surface preparation and plating operations are eliminated. It resists corrosion during processing and serves as the final inside and out finish—or as a base for further plating. Tinning, soldering and brazing operations are made easier with many of the coatings.

Thomas Strip fabricates readily—most of the coatings lubricate dies—stretch die life—give greater production per grind. Coating is unitized with the strip steel base of controlled metallurgy and proper ductility—adheres tightly even during severe forming, drawing and rolling operations.

In addition to the many cost-reducing advantages of making your products from pre-coated Thomas Strip, you improve their appearance—give them added luster and sales appeal. For assistance in selecting pre-coated strip for your operations, write today.

Cold-rolled strip steel electrolytically pre-coated with Zinc, Copper, Brass, Nickel, Lead-Alloy and Chromium in Natural, Planished and Buffed Finishes—Hot Dip Tin and Lead Alloy Coated—Lacquer Coated in Colors—Annealed Spring Steel—Alloy Strip Steel—Uncoated Strip Steel, carefully produced to your specifications.

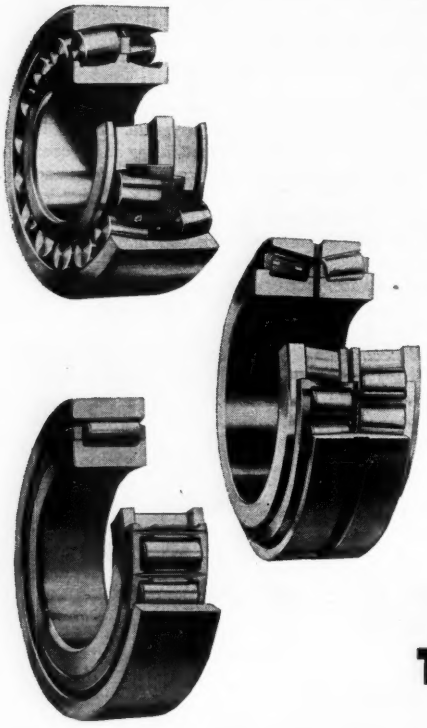
Thomas Strip

a product of

Pittsburgh Steel Company

Thomas Strip Division · Warren, Ohio

...for an impartial decision



What type bearing is best suited to your needs... Straight Roller... Tapered Roller... Spherical Roller... or some other type?

You can be sure of an impartial decision from Torrington which makes *every* type of anti-friction bearing. In addition, Torrington engineers have had broad experience in applying anti-friction bearings to virtually every type of equipment —from household appliances to steel mill machinery.

This experience and an understanding of customers' problems have proved beneficial to many manufacturers. Why not ask a Torrington engineer to help with *your* next problem?

THE TORRINGTON COMPANY
South Bend 21, Ind. Torrington, Conn.
District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON BEARINGS

Spherical Roller • Tapered Roller • Straight Roller • Needle • Ball • Needle Rollers

CALENDAR
OF MEETINGS

May 5-7, Automotive Engine Rebuilders Association: Spring meeting, Hotel Plaza, San Antonio, Tex. Association address: 419 N. Capitol Ave., Indianapolis. Executive vice president: R. G. Patterson.

May 5-7, American Mining Congress: Annual spring meeting, Netherland Plaza Hotel, Cincinnati. Congress address: 1102 Ring Bldg., Washington 6. Secretary: Julian D. Conover.

May 6-8, National Highway Users' Conference: Highway transportation congress, Washington. Conference address: National Press Bldg., Washington 4. Director: Arthur C. Butler.

May 6-9, Scientific Apparatus Makers Association of America: Annual meeting, Edgewater Beach Hotel, Chicago. Association address: 20 N. Wacker Drive, Chicago 6. Secretary: Kenneth Anderson.

May 7-9, Industrial Waste Conference: Purdue Memorial Union, Purdue University, E. Lafayette, Ind. Secretary: Prof. Don E. Bloodgood, Sanitary Engineering Dept.

May 7-10, National Screw Machine Products Association: Annual spring meeting, Hotel Chase, St. Louis. Association address: 2860 E. 130th St., Cleveland. Executive secretary: Orrin B. Werntz.

May 8-9, Steel Products Warehouse Association: Mid-year regional meeting, Hotel Statler, Detroit. Association address: 637 Union Commerce Bldg., Cleveland 14. President: Clayton Grandy.

May 8-9, The Wire Association: Spring meeting, William Penn Hotel, Pittsburgh. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

May 8-9, National Association of Sheet Metal Distributors: Spring meeting, William Penn Hotel, Pittsburgh. Association address: 1900 Arch St., Philadelphia 3. Executive secretary: Thomas A. Fernley Jr.

May 8-9, American Institute of Mining & Metallurgical Engineers: Northwest metals and minerals conference, Davenport Hotel, Spokane, Washington. Publicity director: W. S. Patterson, Kaiser Aluminum & Chemical Corp., Spokane 10.

May 11-14, American Institute of Chemical Engineers: Annual spring meeting, French Lick Springs Hotel, French Lick, Ind. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

May 11-14, Industrial Furnace Manufacturers Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 420 Lexington Ave., New York 17. Secretary: V. P. Gopcevic.

May 12-14, Liquefied Petroleum Gas Association Inc.: Annual meeting and exhibit, Palmer House, Chicago. Association address: 11 S. LaSalle St., Chicago 3. Secretary: Arthur C. Kreutzer.

May 14-15, National Industrial Conference Board: Spring conference, Waldorf-Astoria Hotel, New York. Address: 247 Park Ave., New York 17. Assistant director, conference division: (Mrs.) I. E. Brown.

May 14-16, American Leather Belting Association: Spring meeting, Skytop Lodge, Skytop, Pa. Association address: 320 Broadway, New York 7. Secretary: E. R. Rath.

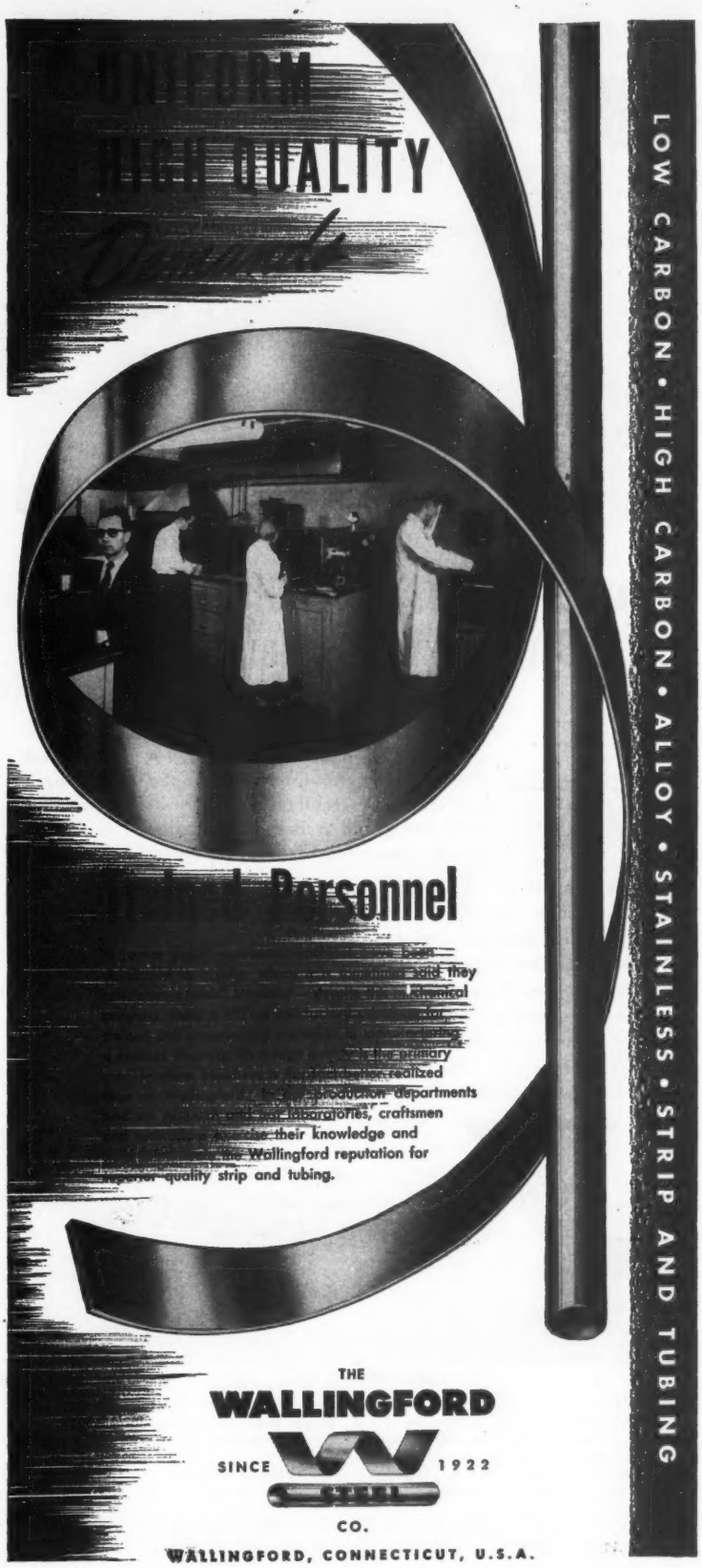
May 14-16, Society for Experimental Stress Analysis: Spring meeting, Hotel Lincoln, Indianapolis. Society address: Box 168, Cambridge, Mass.

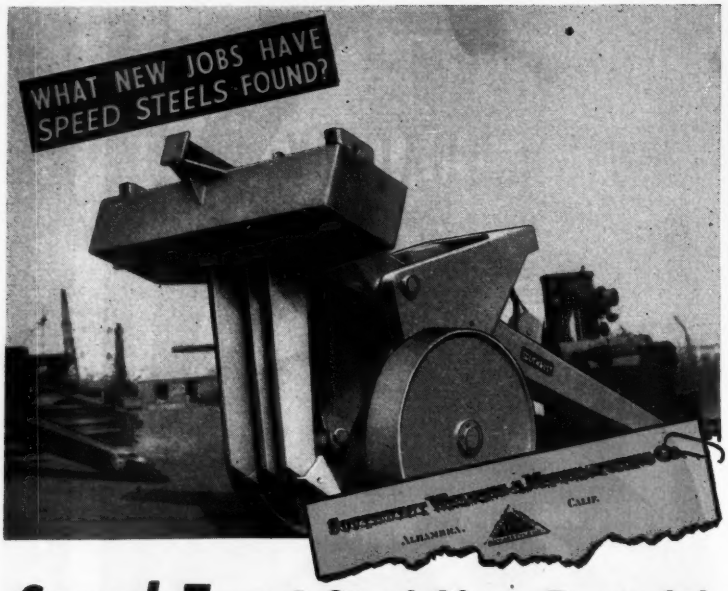
May 18-21, Copper & Brass Research Association: Annual meeting and exhibit, The Homestead, Hot Springs, Va. Association address: 420 Lexington Ave., New York 17. Secretary: Bertram B. Caddle.

May 19, Rail Steel Bar Association: Annual meeting, General Brock Hotel, Niagara Falls, Ont. Association address: 38 S. Dearborn St., Chicago 3. Secretary: W. H. Jacobs.

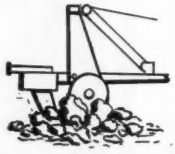
May 19-20, American Steel Warehouse Association Inc.: Annual meeting, Waldorf-Astoria

(*Continued on p. 158*)



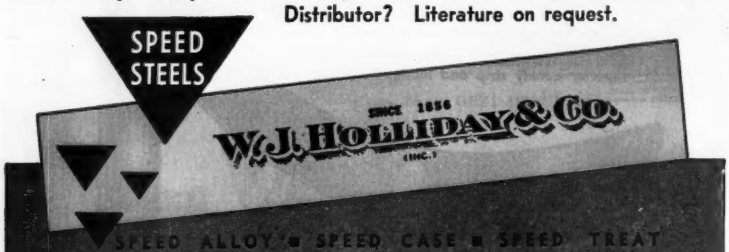


Speed Treat Steel Gives Powerful Brute A Tremendous Bite



The big teeth of this Southwest Cable Ripper have to penetrate rock hard surfaces up to 60" deep and withstand tremendous shock loads. A hard-packed airport runway, for example, snapped off ordinary steel shanks like toothpicks. To give this powerful brute teeth with a real bite Southwest is making them of Speed Treat (x1545) Plate Steel.

A tensile strength of 90-100,000 PSI and Brinell hardness of 156-196 imparts exceptional ruggedness and wearability to these vital components. Speed Treat is a versatile steel, too. Its unusual machinability plus its high physical properties, imparted by its .45% carbon and 1.25% manganese content, have won industry's favor for mechanical rubber molds, flame or induction hardened gears, sprockets, cams, eccentrics, cylinder bearers and countless other items, where machinability, finish, tool life and hardenability are important factors. Chances are you can improve your own product and save money with Speed Treat. Why not talk it over with your Speed Steel Distributor? Literature on request.



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Brown-Wales Co., Boston-Hartford-Lewiston, ■ Bridgeport Steel Co., Bridgeport, Conn. Beals, McCarthy & Rogers, Buffalo, N. Y. ■ Burger Iron Co., Akron, Ohio ■ Grammer, Dempsey & Hudson, Inc., Newark, N. J. ■ Earle M. Jorgensen Co., Los Angeles-Houston-Oakland-Dallas ■ Passaic County Steel Service, Inc., Paterson, N. J. ■ Peckover's Ltd., Halifax-Montreal-Toronto-Winnipeg-Vancouver ■ Peninsular Steel Co., Detroit, Mich. Pidgeon-Thomas Iron Co., Memphis, Tenn. ■ Horace T. Potts Co., Philadelphia-Baltimore

Produced by W. J. Holliday & Co., Inc., Speed Steel Plate Division, Hammond, Indiana. Plants: Hammond and Indianapolis, Indiana

(*Concluded from p. 157*)

Hotel, New York. Association address: 442 Terminal Tower, Cleveland 13. President: Walter S. Doxsey.

May 19-21, National Industrial Distributors Association: Annual meeting, Atlantic City, N. J. Association address: 1900 Arch St., Philadelphia 3. Secretary: H. R. Rinehart.

May 19-21, American Supply & Machinery Manufacturers Association: Annual convention and conference booth activity, Hotel Traymore, Atlantic City, N. J. Association address: 731-732 DuPont Circle Bldg., Washington. General manager: R. Kennedy Hansen.

May 20-21, Nuclear Energy Conference: Michigan State College, E. Lansing, Mich. Program chairman: D. J. Renwick, Mechanical Engineering Dept.

May 21-22, American Iron & Steel Institute: Annual meeting, Waldorf - Astoria Hotel, New York. Institute address: 350 Fifth Ave., New York 1. Meeting director: Frank Ragland.

May 21-23, Gas Appliance Manufacturers Association: Spring meeting, The Broadmoor, Colorado Springs, Colo. Association address: 60 E. 42nd St., New York. Secretary: H. Leigh Whitelaw.

May 22-23, American Coal Sales Association: Annual convention, The Homestead, Hot Springs, Va. Association address: 1625 Eye St., Washington 6.

May 22-24, American Society for Quality Control: Annual meeting & exhibit, War Memorial Auditorium, Syracuse, N. Y. Society address: 70 E. 45th St., New York 17. Secretary: Alfred L. Davis.

May 25-28, National Association of Purchasing Agents: Annual international convention & exposition, Convention Hall, Atlantic City, N. J. Association address: 11 Park Place, New York 7. Executive secretary: George Renard.

June 1-6, Society of Automotive Engineers: Summer meeting, Ambassador & Ritz-Carlton Hotels, Atlantic City, N. J. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

June 2-3, Multiple V-Belt Drive & Mechanical Power Transmission Association: Spring meeting. Edgewater Beach Hotel, Chicago. Association address: 7 W. Madison St., Chicago 2. Secretary: Harry P. Dolan.

June 2-4, American Gear Manufacturers Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 302 Empire Bldg., Pittsburgh 22. Executive secretary: John C. Sears.

June 3-6, National District Heating Association: Annual meeting, Skytop Lodge, Skytop, Pa. Association address: 827 N. Euclid Ave., Pittsburgh 6. Secretary-treasurer: John F. Collins.

June 5-7, Electric Metal Makers Guild Inc.: Annual meeting, French Lick Springs Hotel, French Lick, Ind. Guild address: Box 6026, Mt. Washington Station, Pittsburgh. Secretary: C. B. Williams.

June 9-21, International Organization for Standardization: Triennial meeting, Columbia University, New York. Secretary-general: Henri St. Leger, Geneva, Switzerland. Host association: American Standards Association, 70 E. 45th St., New York 17. Secretary: George F. Hussey Jr.

June 15-18, National Association of Cost Accountants: Annual international cost conference, Waldorf-Astoria Hotel, New York. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnarson.

June 15-19, American Society of Mechanical Engineers: Semi-annual meeting, Sheraton-Gibson Hotel, Cincinnati. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

June 16-18, Malleable Founders Society: Annual meeting, The Homestead, Hot Springs, Va. Society address: 1800 Union Commerce Bldg., Cleveland. Secretary: Lowell D. Ryan.

June 16-20, American Electroplaters Society: Annual meeting and industrial finishing exposition, Hotel Conrad Hilton and International Amphitheatre, Chicago. Society address: Box 168, Jenkintown, Pa. Secretary: D. Gardner Foulke.

June 22-24, Alloy Casting Institute: Annual meeting, The Homestead, Hot Springs, Va. Institute address: 32 Third Ave., Mineola, N. Y. Secretary: E. A. Schoefer.

Read the facts about

AIRCO's NEW NO. 20 RADIAGRAPH

Up-to-the-minute in design, the No. 20 Radiagraph is Airco's newest service-proven portable gas cutting machine.

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Iron and Steel *need protection too!*

If it's made of iron or steel,
and exposed to the elements,
remember to have it
Hot-Dip Galvanized—*sealed in zinc!*

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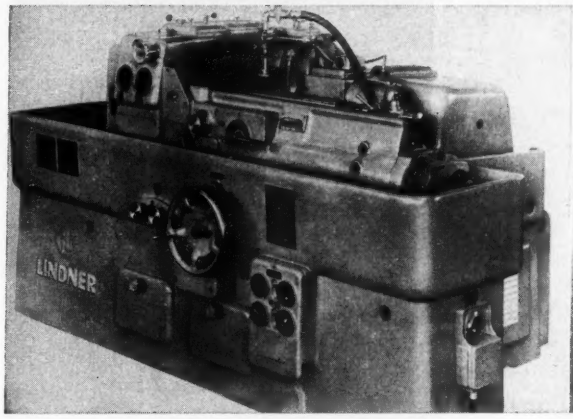
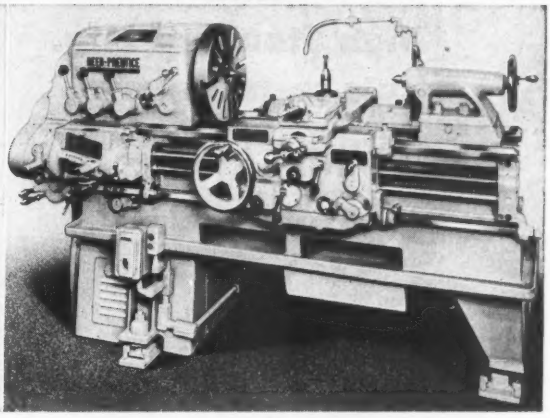
New Products and Equipment



THREAD GRINDERS FOR FOUR STANDARD RANGES
. . . offer close tolerances on traverse and plunge operations



COMPENSATION FOR LACK OF LEVEL FOUNDATIONS
. . . solves accuracy and alignment problems in shipboard work

Precision Thread Grinders

USE REPLY CARD—CIRCLE No. 1

Close tolerances on traverse and plunge grinding are attributed to four standard types of Lindner thread grinding machines, distributed by Kurt Orban Co. Inc., 205 E. 42nd St., New York 17. Lead tolerances can be held within 0.00008-inch over a 1-inch length and within 0.00024-inch over a 20-inch length.

All types incorporate the same fundamental design principles, but each is built for a particular range of tool room or production work. Type A is designed for internal and external grinding, without relieving action, of high precision micrometer spindles and thread gages. Type B is a universal toolroom machine, suitable for internal and external grinding. It has single or multiple profile wheels for work on gages, threading and cutting tools, hubs and profiled cutters. Type C is a production machine with relieving attachment, adapted to plants producing tools that call for both single and multiple profile wheels. Type D is a production machine designed for turning precision threads and forms by plunge grinding with wide double profile wheel.

Live Roller Conveyor

USE REPLY CARD—CIRCLE No. 2

Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y., announces its live roller conveyor, made in widths from 6 to 36 inches. Rollers are 2 inches diameter, spaced to meet customer's requirements. Belt passing underneath and touching each roller above drives the rolls. Unit is made for shipping and processing departments, where parts must be placed on and taken off conveyor line rapidly and easily. Standard speed is 50 fpm, increased or decreased as is necessary. Variable speeds are also available.

Guillotine Hydraulic Cutter

USE REPLY CARD—CIRCLE No. 3

Hand-operated hydraulic guillotine cutter, made by Manco Mfg. Co., Bradley, Ill., cuts a maximum ½-inch reinforcing rod. Model 200 weighs 12 pounds and is 21 inches long. Features include pressure of 8500 psi, exerting 10 tons thrust in a hand-operated unit. Dual ratio pump combines rapid traverse with high power to minimize cutting time. Blades are alloy tool steel.

REPLY CARDS

on page 175 will bring you more information on any new products and equipment in this section.

Engine Lathe Withstands Shock

USE REPLY CARD—CIRCLE No. 4

Specially-designed engine lathe, developed by Reed-Prentice Corp., Worcester, Mass., is designed to solve accuracy and alignment problems in precision work aboard ship. Lathe compensates for lack of level foundations, withstanding shock through a fabricated steel bed to which are attached hardened steel ways.

Bed rests on a full-length base, supported by welded steel legs set on three cushioned bearings. These bearings sustain the machine's weight, anchoring it in position. Each bearing has an individual function: The rear is a pivot; front allows horizontal motion at right angles to work centers; and tailstock bearing permits horizontal motion in all directions. Lathe is adaptable for plant installation.

Constant Current Supply

USE REPLY CARD—CIRCLE No. 5

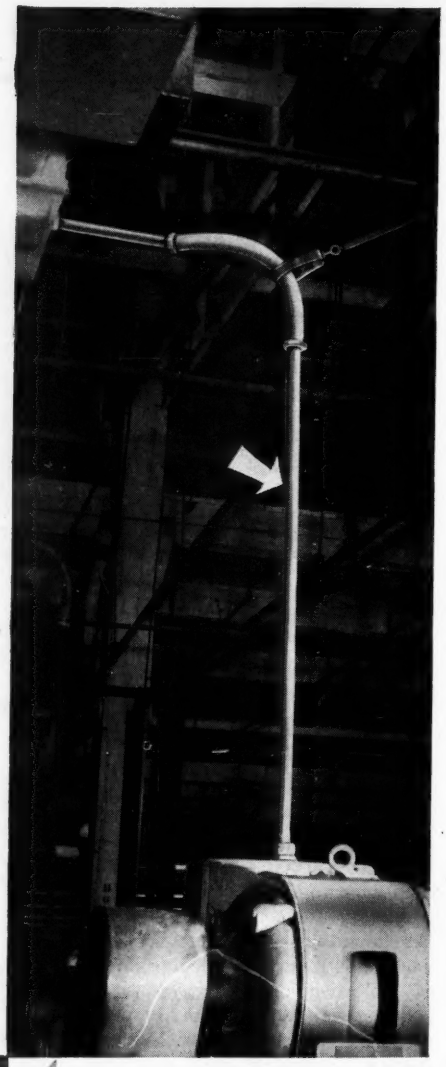
Steady direct current source is provided from an alternating current line by an electronic current supply introduced by Weston Electrical Instrument Corp., 617 Frelinghuysen Ave., Newark 5, N. J. Unit is designed primarily for use with potentiometer indicators, recorders and controllers where automatic standardization is not feasible and use of batteries is undesirable. It is also used with resistance thermometers, strain gages

How High Standard Mfg. cuts costs by using POWERDUCT from busduct to machine

"Powerduct Cable means a big saving for us," says Frederick Lynn, chief electrician at The High Standard Mfg. Corp., Hamden, Conn., makers of Hi-Standard firearms, internationally famous for their accuracy and painstaking craftsmanship.

"You'd be surprised that a very big item is being able to use Powerduct over and over again as production increases and model changes are made. Twelve feet, fifteen feet, it doesn't make any difference. I'm able to use it any place. Powerduct is never wasted. That's why it's less expensive.

"Because busduct with Powerduct means complete flexibility, we increase the use and mobility of the machine. Our crew saves many man-hours by being able to plug in Powerduct instead of wiring a whole rigid conduit system."



"For heavy equipment we plug the cutout in the busway and run the Powerduct almost directly to the machine. It's not likely this machine will be moved, so the usual loop is not necessary."

"Here's the installation for lighter equipment. By varying the size of the loop I can move the machine."

Powerduct complies with Section 3646 to the 1951 National Electrical Code.

Powerduct has full Underwriters' approval, costs less than any other approved type of cable. For further details on Powerduct, contact your nearest Anaconda Distributor or Anaconda Sales Office—or write to Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

52376

the right cable for the job ANACONDA® wire and cable

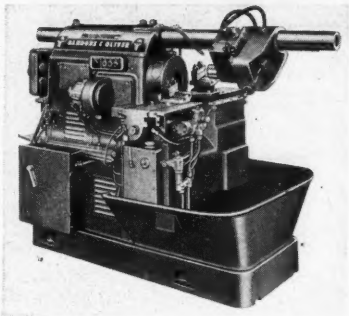
or other devices requiring constant direct current.

Standard model is made for 10 milliampere output at 1.4-v dc, providing current within limitation of plus or minus 1/10 of 1 per cent. Compensated feed-back circuit allows flat current characteristic over 80 to 140-v range.

Cutoff Lathe Line Expanded

USE REPLY CARD—CIRCLE No. 6

Two cutoff lathes, models 33 and 34, are introduced by Bardons & Oliver Inc., 1147 W. 9th St., Cleveland 13, O. Models feature the company's automatic stock feed table, operating on electric remote



. . . feed table operates automatically

control which permits automatic cutoff to any length. Spindle speeds range from 85 to 1100 rpm, with four quick changes. A pair of reversible pick-off gears make available a total of eight speed changes.

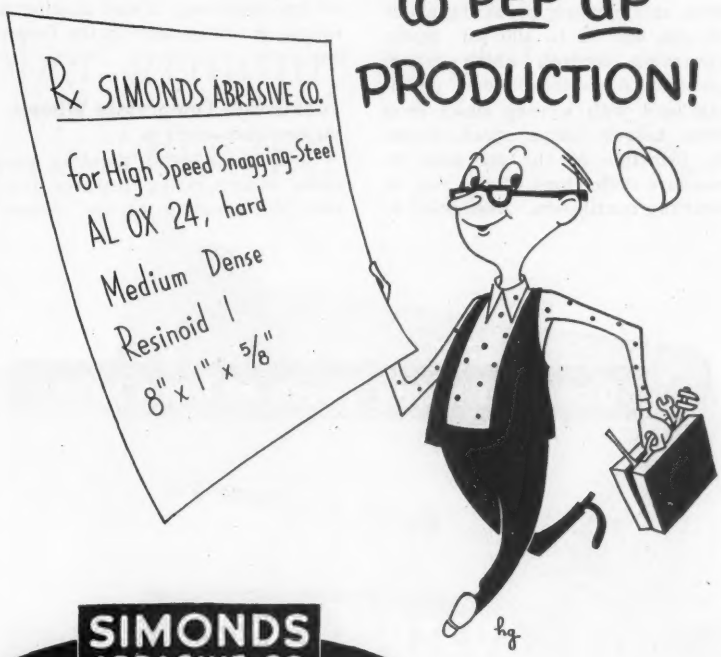
Independent hydraulic systems are used for cutoff slides and collet chuck operations. Model 33 has capacity to 3 inches diameter; model 34, 4 inches diameter. No cams are employed and complete setup change from one size and length of work to another can be done in less than 30 minutes.

Internal Grinding Spindles

USE REPLY CARD—CIRCLE No. 7

Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford 1, Conn., offers air-driven internal grinding spindles having wide range with governed speed control. Two units are made to cover 35,000 - 100,000 rpm. This range provides about 5000 surface feet per minute for grinding wheels or points from 5/32 to ¾-inch in diameter. A low range unit can be

Here's a prescription to PEP UP PRODUCTION!



SIMONDS ABRASIVE CO.

Grinding Wheels

Simonds Abrasive Borolon wheel, Resinoid bonded for high speed grinding! That's the meaning of *this* prescription . . . an effective one for detouring trouble during grinding operations. Chances are you'll find the right prescription for *your* grinding headaches in our free data book. It lists wheel specifications for all your grinding jobs and gives details on Simonds' complete line, including mounted wheels and points, segments and abrasive grain. Let's send it to you together with the name of your nearby Simonds Abrasive distributor. Write.

SIMONDS ABRASIVE CO., PHILADELPHIA 37, PA. BRANCH WAREHOUSES: CHICAGO, DETROIT, BOSTON
DISTRIBUTORS IN PRINCIPAL CITIES

Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y., Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

adjusted to hold any selected speed within 35,000-50,000 rpm; high range unit, within 60,000-100,000 rpm.

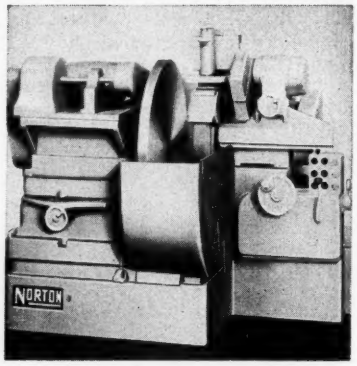
Heads are designed to operate from an air supply providing about 25 cfm and 80 to 100 psi. Speed governing control, which makes possible operation under grinding load with a very small drop from nearest idling speed, works on principle of the air gage to measure deflections of the ring of whirling cantilevers. Assembled to the inner end of the spindle, these cantilevers surround and nearly seal a small air orifice. As the turbine increases speed, centrifugal force springs cantilever away from orifice, unsealing it and causing a change in air pressure in the feeder line.

Tool Grinds Compressor Wheels

USE REPLY CARD—CIRCLE No. 8

Compressor wheel grinding machine incorporating features that simplify grinding on jet engine compressor wheels or similar work is offered by Norton Co., Worcester 6, Mass. Workhead spindle is designed for convenient mounting of face plates, chucks or other workholding fixtures. It accommodates work to 42-inches diameter. Mounted on a swivel table, workhead has longitudinal and cross adjustments. Table also has longitudinal power traverse with automatic reversals from a hydraulic motor unit.

Automatic feed cycle, timer controlled, minimizes manual tasks in external grinding. This, with hand feed mechanism also provided, permits operator to tend two or more machines. Automatic wheel guard type truing device, pushbutton controlled, eases and speeds turning of the external grinding wheel. An internal grinding wheel, mounted on the head wheel, is optional where grinding internal surfaces is necessary.



. . . simplifies work on jet engine wheels

Vertical Lift Spots Materials

USE REPLY CARD—CIRCLE No. 9

Vertical hydraulic lift, designed to ease handling by placing materials in position for fabrication, is offered by Lange Lift Co., 102 W. Fowler St., Milwaukee 3, Wis. Lift can be placed directly on or bolted to the floor for permanent installation. Where mounted in this manner, its 24 x 60-inch standard platform is 7½ inches above the floor in lowered position, 30 inches high in raised position. Mounted on wheels, the lift is used for standard truck operation.

Lifting power results from a foot-operated hydraulic pump built into the base. Power operation

Good for many years at hard labor

YORK·GILLESPIE

CUSTOM-BUILT MACHINERY

for

Steel Mills • Steel Fabricators
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Now is the time to modernize your industrial machinery. For never before has American industry encountered such a challenge! Its double job of producing for defense and civilian needs demands plant machinery built stronger, to last longer.

York-Gillespie Manufacturing Company — designers and custom-builders of special machinery — and York Engineering and Construction Company form an unbeatable team working to develop and build machinery to fit your production requirements.

From Your Own Blueprint or Our Design

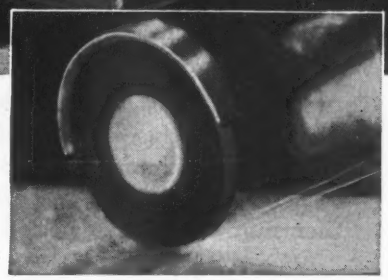
Special machinery is created in our shops from your own design . . . or we will design and fabricate to solve your specific problem.

Send York-Gillespie your machinery specifications. Your inquiries will receive prompt attention.

YORK-GILLESPIE MANUFACTURING CO.
and
YORK ENGINEERING & CONSTRUCTION CO.
951 Penn Avenue, Pittsburgh 22, Pa.

U. S. Rubber grinding wheels work efficiently

And this is why: "U.S." Wheels are the result of over 89 years' experience in bonds and abrasives. United States Rubber Company engineers have so much experience and research data behind them that they can't be excelled when it comes to making the right wheel for the specific job, whether it's ordinary, unusual, or entirely new. "U.S." has made the performance of grinding wheels more economical and productive, and hence has increased worker output. Write to address below.



Grinding welded sections of a continuous drier. U.S. Royalite Grinding Wheels are ideal for portable snag grinding.

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UNITED STATES RUBBER COMPANY

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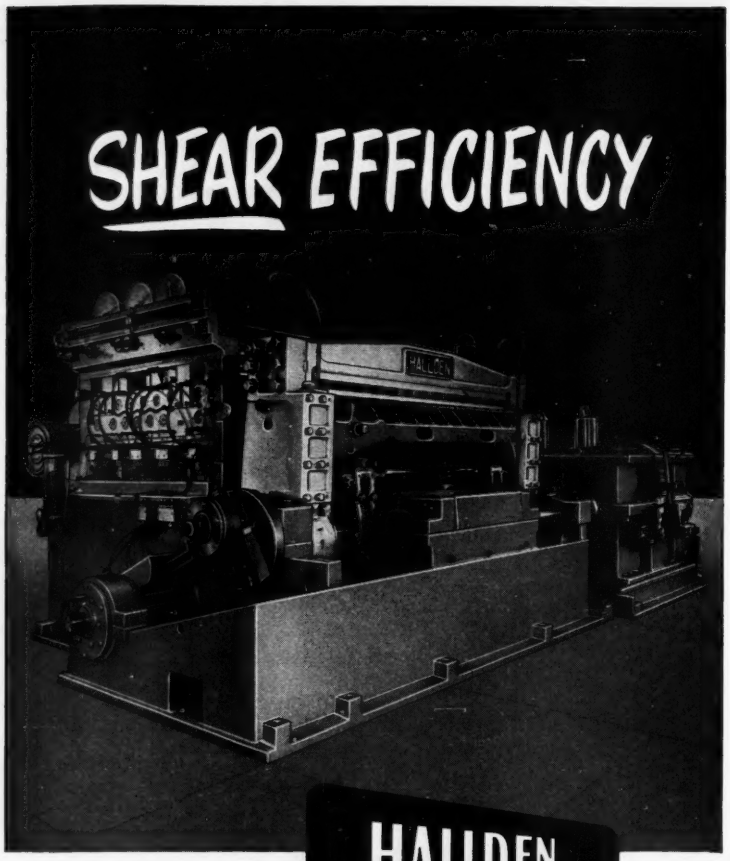


Hallden Machines are designed to give modern steel mills maximum efficiency in flattening and cutting off operations. They permit continuous feed of metal through the machine at accelerated speeds while maintaining precision cutting accuracy. Low center of gravity, rugged construction and compactness assure uninterrupted operation. Remember, too, that Hallden Shears are completely automatic.

Take *your* shearing problems to Hallden, the *shearing specialists.*

THE HALLDEN MACHINE COMPANY

THOMASTON, CONNECTICUT

Sales Representatives

The Wean Engineering Co., Inc., Warren, O. T. E. Dodds, Pittsburgh, Pa.

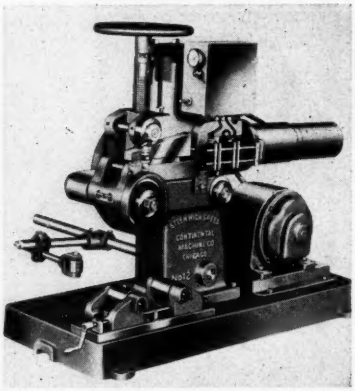
W. H. A. Robertson & Co., Ltd., Bedford, England

can be substituted where necessary. Lift is accomplished through a cam action that, in effect, rolls the load upward. To accomplish this, ram and roller pressures remain almost constant throughout entire lifting cycle. Standard model's capacity is 2000 pounds. For special application, units are available in capacities to 30,000 pounds.

Automatic Cutoff Machine

USE REPLY CARD—CIRCLE No. 10

Machine that cuts a maximum 60 pieces of 12-inch pipe and tube per hour is announced by Continental Machine Co., 1952 N. Maud Ave., Chicago 14, Ill. Maximum speed



. . . cuts 60 pieces of 12-inch pipe per hour

on smaller sizes is proportionately faster. Operator feeds pipe to the adjustable set stop. Precision electrical controls and air mechanisms gage accurately the speed at which the blade approaches pipe. When foot switch is actuated, pipe starts spinning slowly as the blade engages it. After initial pipe movement and contact by the blade, heavy cutting pressure is exerted. Blade is retracted automatically after each cut.

Unit Heats 16,000-24,000 sq ft

USE REPLY CARD—CIRCLE No. 11

Prat-Daniel Corp., S. Norwalk, Conn., announces a Thermobloc heating unit capable of producing 2 million Btu per hour. Designed for large industrial applications, machine heats an area 16,000-24,000 sq ft. Model has twin heat exchangers arranged in form of a V to get maximum scrubbing of heating surfaces by passage of air. For discharge, diffusers give pin-

Because of their generous wing spread, Central Patented Thumb Screws are specified by most electric fan manufacturers to insure *fast* assembly, *secure* tightening and *easy* adjustment. And, in air conditioners where the terrific torsional strain of power driving is a prime consideration—Central's specially heat-treated Self-Tapping Screws are abundantly used with standard slotted, hexagon and Phillips recessed heads, types A-B-C and U. For the widest range of fasteners and the largest facilities to produce them *fast* . . . order from Central.

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Fast DELIVERIES...

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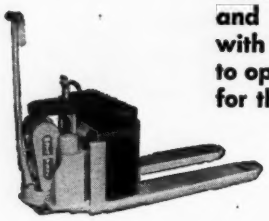
MOTO-TRUC'S MODEL PAL

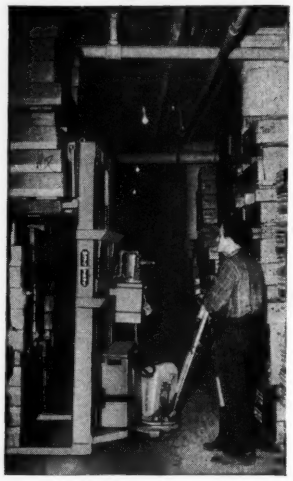
- Reduces Costs
- Saves Man Hours
- Speeds Production

Model PAL Pallet



Break those Production Bottlenecks and reduce handling manpower with Moto-Truc's efficient and simple to operate "Walkies". They soon pay for themselves in savings to you.

Whether its a problem of warehousing, production "Flow" or "Inprocess" inventory; one or more of Moto-Truc's 6 Basic Models is quickly adaptable to your specific needs. Their short turning radius and added power make them the most efficient in the "Walkie" field.



A "twist of the wrist" does it.

Model PAL-SC, Pallet

The above photo shows one of Moto-Truc's Model PALS in a large eastern warehouse. They now do the work of many hands, adding 1/3 more storage space and speed up "in and out" traffic. In Pallets, Platform or Hi-lift types, Moto-Trucs cover the field for efficiency, rugged, all-welded construction and ease of operation.

Write for Bulletin No. 51 Today

DON'T BE SATISFIED WITH LESS THAN THE BEST.

THE MOTO-TRUC CO.

1953 E. 59th STREET • CLEVELAND 3, OHIO

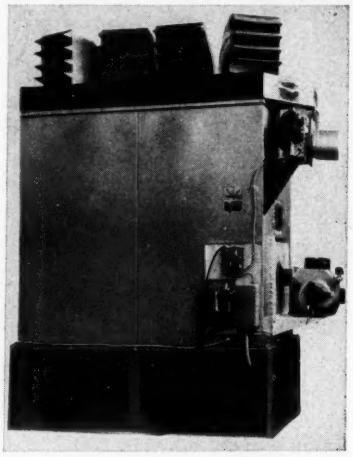
PALLET, PLATFORM AND HI-LIFT TRUCKS

LARGEST EXCLUSIVE MANUFACTURER OF "WALKIES"

MOTO-TRUC Designers FOR THE INDUSTRY PATENTED

point control of air throw. These outlets can be rotated a full 360 degrees to gain the required position.

Single ducts can be run from any outlet to adjoining rooms where heat is needed, but the unit can also be used as a central heating



. . . produces 2 million Btu per hour

plant with plenum chamber replacing the four diffusers. Normal air output is 22,000 cfm; air intake velocity, 440 fpm. Fan is powered by a 10 hp motor.

Heavy-Duty Arc Welders

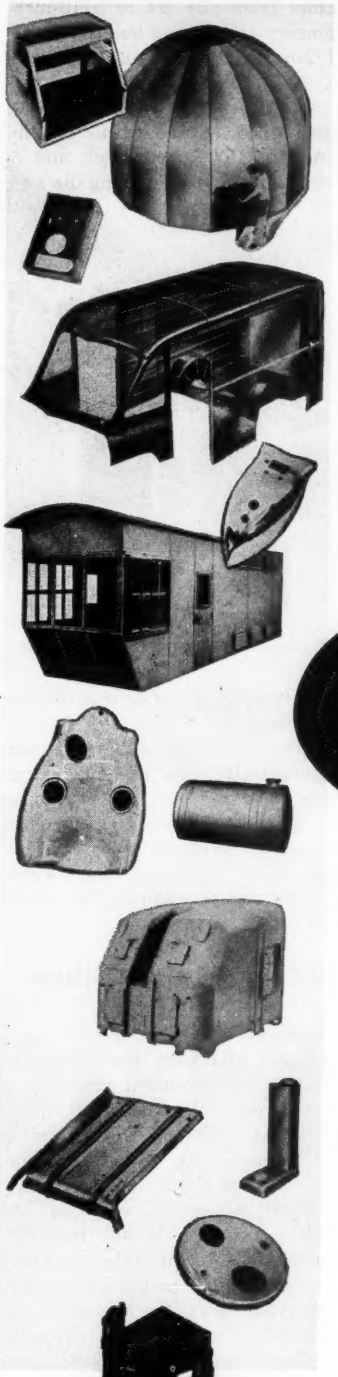
USE REPLY CARD—CIRCLE No. 12

Line of heavy-duty alternating current arc welders is announced by Trindl Products Ltd., 17 E. 23rd St., Chicago, Ill. Made in models 200A, 300A and 400A, welders have wide application range on production and maintenance operation. Model 200A operates from 110 or 220-v, with 20 to 200-amp heat range and handles rods to 3/16-inch on work to 1¾-inch thick. Latter two models operate from 220-440-v lines, each with 36 different heat stages ranging from 30 to 300 and 400 amp respectively. Eye-level control panel simplifies heat selection from all operating angles. All are easily portable.

Thread Roller Capacity Raised

USE REPLY CARD—CIRCLE No. 13

Increased capacity automatic thread roller, the model A-312-H, is offered by Hartford Special Machinery Co., 287 Homestead Ave., Hartford 12, Conn. Machine rolls



FORMING STAMPING WELDING

BRANDT
OF BALTIMORE

BRANDT'S "BIG THREE"
TO STEP UP YOUR METALWORKING JOB

Brandt's complete metalworking facilities are working together for time-wise contractors all over the country. Multiply *your* production output *3-ways* with Brandt!

STAMPINGS • WELDMENTS
SPOT WELDED ASSEMBLIES • PRESSED STEEL SHAPES
in all types of metal

✻ *Send for handy file folder of complete facilities.*

CHARLES T. BRANDT, INC.
1700 Ridgely Street, Baltimore 30, Maryland

240,000 sq. ft. of modern, mass production facilities close to main line rail, highway and air transport.

"MULTICUT" "TUFCUT" "HOT WORK"

Wapakoneta
SHEAR BLADES
and ROTARY KNIVES

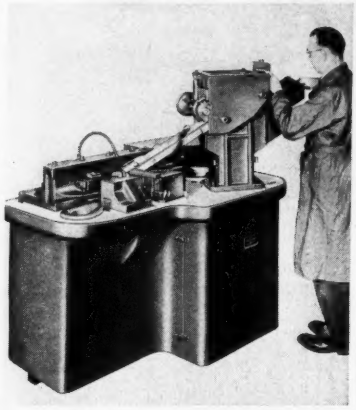
Any type or size blade of proper Alloy with correct hardness and temper for every type shearing machine and every kind of job.

Rx ENGINEERED TO THE JOB

Every Wapakoneta blade is made to exact specifications, designed for the particular job. Complete records with order number of each blade makes possible duplication of exact size and temper at any time.

The WAPAKONETA MACHINE CO.
Shear Blade Specialists Since 1891
Wapakoneta, Ohio

screws from size six to 5/16-inch diameter and thread lengths up to 2 1/2-inch. Production rates are 80, 100, 120 and 140 pieces per minute, depending on size of screw being rolled. Standard die dimensions are 15/16-inch thick and 5 inches long for the moving die and



. . . rolls a maximum 140 pieces per minute

15/16-inch by 4 1/4 inches for the fixed die.

After rolling, screws are ejected automatically into a funnel that leads to a tote box in the rear of the machine. Unloading is done manually. Model is powered by a 5-hp motor with starting switch and automatic cut-out for overload safety.

Self-Contained Air Conditioner

USE REPLY CARD—CIRCLE No. 14

Upright self-contained air conditioner, featuring two complete separate refrigeration circuits, is an addition to the packaged equipment line made by United States Air Conditioning Corp., Minneapolis 14, Minn. Dual circuit provides economy of operation when full cooling capacity is not required. Design features include a manual by-pass damper in the blower section that permits increased dehumidification without excessive cooling. Semi-hermetic compressor sections minimize space requirements and maintenance problems. Condenser-receivers have pressure relief valves. Charging valve on liquid line facilitates charging the unit. Separate magnetic starter for fan motor provides full overload protection.

Both are 5-ton circuits, set up on pump-down cycle, eliminating

20th Century

the persuasive abrasive

Any reference to 20th Century Drawn Steel Shot will emphasize its highest quality, economy and ability to stand hard use.

THE CLEVELAND Metal Abrasive CO.

802 East 67th Street Cleveland 8, Ohio
Howell Works: Howell, Michigan

One Of The World's Largest Producers Of Quality Abrasives
Normalized (Copyrighted Trade Name)–Hard Iron–Cut Wire–Powder

slugging of compressors at start-up. Two-stage remote bulb thermostat is included as standard equipment, but a remote room unit can be used if desired.

Machine Cleans Fine Parts

USE REPLY CARD—CIRCLE No. 15

Zenith Mfg. & Chemical Corp., 52 Beekman St., New York 38, N. Y., offers its Intro-Met—a machine made for cleaning delicate instrument parts. Among top features attributed to the unit are three clear-view windows on motor support for checking while machine is operating; spun aluminum tanks and covers used instead of glass; and a heavy cast aluminum basket with 33⅓ per cent more capacity.

Tanks are 10 inches high and have 10-inch diameter to obtain a 4-gallon capacity. Basket has three Monel mesh removable compartments for cleaning a variety of parts simultaneously. Unit is snapped onto impeller shaft eliminating hazards of accident or loosening. Machine is operated by 14 to 1 gear reduction ball bearing motor on alternating or direct current.

Prepares Metal for Finishing

USE REPLY CARD—CIRCLE No. 16

Diversy Corp., Chicago 13, Ill., announces two cleaners for preparing metal surfaces for finishing operations. Divobond is for phosphatizing iron and steel prior to painting. It forms a thin but tough skin on iron and steel which retards rusting of clean metal prior to painting. No. 101 is an alkaline material for electrocleaning brass prior to plating.

Soft Plastic Mallets

USE REPLY CARD—CIRCLE No. 17

A line of soft plastic mallets is introduced by Matticks Mfg. Co., Los Angeles 23, Calif. There are seven models with head weights varying from 1 to 14 ounces, head diameters between ¾ and 2 inches and head lengths between 2¾ and 4 inches. A steel locking pin holds the head securely to the hickory handles.

Corrosion-Proof Extinguisher

USE REPLY CARD—CIRCLE No. 18

Automatic fire extinguisher, available from Red Comet Inc., Littleton, Colo., is corrosion and rust-proof. When fire breaks out, heat releases a fusible clip which frees a coiled spring built into the lower section of the extinguisher. Plunger shatters glass container, releasing carbon tetrachloride.

Adjustable Machine Lamp

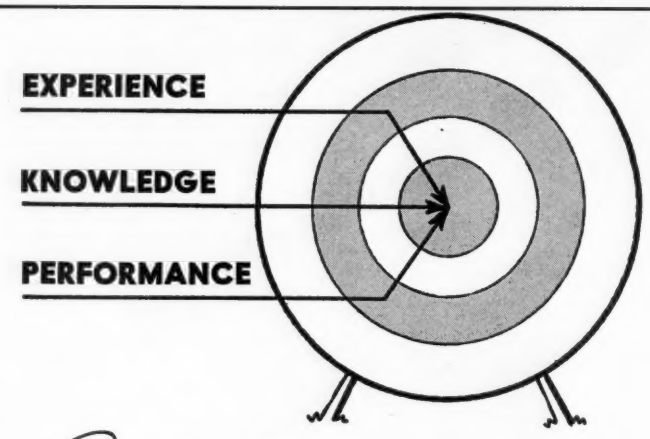
USE REPLY CARD—CIRCLE No. 19

An adjustable machine lamp that throws a flood of light directly on working areas is offered by Bretford Mfg. Inc., Franklin Park, Ill. To avoid oil damage, Textolite bearings and an oil resistant cord with supplementary vinylite insulation are used throughout.

Electronic Control Relay

USE REPLY CARD—CIRCLE No. 20

Designed to operate in conjunction with a differential transformer transmitter, an electronic control relay is introduced by Automatic Temperature Control Co., Philadelphia 44, Pa. To obtain control



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EXPERIENCE— in every phase of engineering, design and construction.

KNOWLEDGE— 35 years of active service in the Industry.

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These are the qualifications combined in one firm to give you personalized engineering service.

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HOW TO SAVE MONEY ON STAMPING RUNS OF LESS THAN 10,000

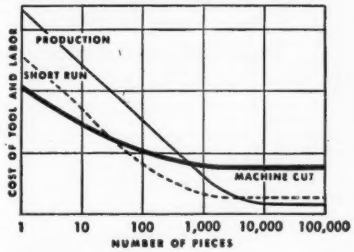
FOR EXAMPLE: TAKE THE PART ILLUSTRATED

If your total requirement is 1 to 65 parts, our Machine-Cut Method is the most economical. You pay no die costs whatsoever.

If your total requirement is for 65 to 7,000 parts, the Short Run Method using our exclusive Hecht-type dies, combined with specialized bench press operations, is most satisfactory. Die costs are extremely reasonable.

If your total requirement exceeds 7,000 parts, the standard Production Method, using the best quality dies, gives the lowest unit cost. Die costs, though higher, can be spread over a greater number of parts.

The logarithmic chart below shows the computation which the skilled Methods Engineer makes to arrive at this conclusion, for the particular part illustrated. Though the computation varies for almost every part, the general principle remains the same.



(Send today for our free, 12 page booklet full of helpful facts on buying stampings. Profusely illustrated.

. . . the exclusively short run supplier is *NOT* always the best source

The Methods Engineer, skilled in stamping practice, will tell you that a run of 10,000 or less might be produced by any one of three methods. Here's what decides which is the most economical:

1. **The quantity of each run**
2. **The *total* requirement for the part**
3. **The costs of various *types* of dies**
4. **The labor factor**

Quantity alone does not decide the method.

THE MOST IMPORTANT ECONOMY FACTOR IN BUYING STAMPINGS IN LIMITED QUANTITIES

Whenever possible, advise your stampings supplier of your total requirements. Your *second order* of the same part may justify a production-type die on the *first* order. The chart at left illustrates this. Whenever you can, avoid buying the expensive labor factor that is necessarily figured in the Machine-Cut or Short Run Methods.

Get your quotations from a stampings supplier who can impartially quote you on the most efficient production method. This will be the supplier, like our Stampings Division, who is equipped for all three!

STAMPINGS DIVISION

LAMINATED SHIM COMPANY, INC.

3405 UNION STREET — *ESTABLISHED 1913* — GLENBROOK, CONN.

FOR EFFICIENT PRODUCTION — WHETHER ONE PART OR A MILLION

BARBER COLMAN

fine-cut
Reamers

FOR ULTIMATE IN FINE FINISH
AND CLOSE LIMITS OF ACCURACY

QUALITY REAMED HOLES
Plus
LOW MAINTENANCE, OPERATING COSTS

Pin and wedge design affords more blades per reamer diameter which in turn makes for better finish and maintenance of size. Easy adjustment, quick set-up and sturdy, non-shift blade mounting provide long economical operation.

AVAILABLE FROM STOCK FOR IMMEDIATE SERVICE

BARBER-COLMAN COMPANY
985 ROCK STREET
ROCKFORD, ILLINOIS

of any variable, differential transformer is adjusted to exact point at which control is desired. This position is sensitive to less than 0.0001-inch. Relay is sensitive to any signal given and either pulls in or drops out depending on direction of signal.

Removes Liquid and Vapors

USE REPLY CARD—CIRCLE No. 21

James A. Murphy & Co. Inc., Hamilton, O., introduces a separator filter, adapted for ½ or ¾-inch psi, that removes condensate liquid and vapors from compressed air. Removal of vapors is accomplished by use of desiccant.

Trigger-Start Ballast

USE REPLY CARD—CIRCLE No. 22

Two-lamp Circline fluorescent fixtures using a 22-w and a 32-w Circline lamp can be powered with one trigger-start ballast made by General Electric Co., Schenectady 5, N. Y. It provides instant, simultaneous starting of both lamps. Ballast operates on 110-125 v, 60 cycles.

Electrode Stabilizer

USE REPLY CARD—CIRCLE No. 23

Blueweld Lo-Hydrogen electrode stabilizer, designed to keep moisture content of electrode shielding in proper balance, is announced by Fred C. Archer Inc., Milwaukee 3, Wis. Temperature is controlled by a variable thermostat. Austenitic and ferritic low hydrogen electrodes may be stored.

Polyester Laminated Sheets

USE REPLY CARD—CIRCLE No. 24

Iolyte polyester laminated sheets in continuous strips of any desired length, in thicknesses from 8 mils to ¼-inch or more are announced by Industrial Organics Corp., Maspeth 78, N. Y. It may be ordered in sheets, rolls or tape. Iolyte is lighter than aluminum or magnesium,

USE A
REPLY CARD
Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

69. Protection for Aluminum

American Chemical Paint Co.—Brush Alodine, a tough, durable coating that protects both painted and unpainted aluminum, is described and its advantages given in 6-page form No. 690. Photos show treating procedure and examples of panels coated by different processes.

70. Production Facilities

Charles T. Brandt, Inc.—"For Your Defense Program Enlist Brandt" is title of 4-page illustrated folder which outlines company's facilities for producing stampings, weldments, spot welded assemblies and pressed steel shapes in all types of metals. Accompanying 4-page folder lists plant facilities and includes quantity, description, capacity and size of each piece of equipment.

71. Strapping System

Brainard Steel Co.—Detailed in 12-page illustrated brochure "Brainard Strapping System" are the strapping engineering services offered by the company and the types of strapping, tools and accessories which make up the system. Equipment is illustrated and specifications are given.

72. Power Transmitters

Standard Pressed Steel Co.—Illustrations, specifications and order codes for Hallowell steel collars and Pioneer power transmitting appliances are detailed in illustrated bulletins bearing numbers 653-2 and 664-2, respectively.

73. Ventilator Fabrication

Burt Mfg. Co.—In celebration of their 50th anniversary company has published 24-page brochure which cites its historical highlights; pictures and describes its gravity and fan ventilators, wall louvers, oil filters, exhaust heads and sheet metal specialties; and illustrates its plant, engineering and testing facilities. List of sheet metal fabricating equipment is included.

74. Tool Steels

Bethlehem Steel Co. — Properties, applications, advantages, heat treatment, and other data on carbon and carbon-vanadium tool steels are contained in 20-page illustrated booklet 261. Much information is given in table and graph form, and photographs show test results and applications.

75. Corrosive Fume Exhausters

Buffalo Forge Co.—Typical users, types of fumes handled and construction of rubber-lined exhausters for handling corrosive fumes are covered in 4-page illustrated bulletin 2424-F. Sizes and types are offered to suit every need.

76. Four-Rope Buckets

Blaw-Knox Co., Blaw-Knox Div.—Ten vital items intended to guide the purchaser of four-rope buckets for overhead or bridge type cranes are a feature of 44-page illustrated bulletin No. 2392. Illustrations cover numerous bulk handling applications. Performance data are included, along with other technical information.

77. Steam Generator

Clayton Mfg. Co.—Specific industrial application details for automatic self-contained steam generator are included in 12-page illustrated form C-10.1. Use of single and multiple installations is described and operational data for sizes and models offered are covered.

78. Press & Automatic Former

Baird Machine Co.—12-page bulletin "Four-Slide Wire Forming" and 6-page bulletin "Automatic Bench Power Press" give specifications and show typical products produced by these automatic forming machines.

5-5-52

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Penton Building, Cleveland 13, Ohio

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79. Die Breakage Preventer

Brinnell Co.—Plants that have machines equipped with Protection electronic devices for preventive maintenance are reporting production step-ups of 12½ to 22 per cent, tool and die breakage reductions as high as 86 per cent and manpower gains to 300 per cent. How these savings have been effected on automatic machines are reported in 8-page illustrated bulletin No. 252.

80. Production Machines

Buhr Machine Tool Co.—Twenty-eight types of special machinery for drilling, tapping, reaming and chamfering production equipment are described in 48-page illustrated catalog. Details of each machine and the work it does are given.

81. Press Line

E. W. Bliss Co.—28-page general catalog 35-C describes and illustrates complete range of mechanical and hydraulic presses and special machinery for almost every type of metalworking operation. Included are condensed specifications and dimensions.

82. Industrial Fire Fighting

"Automatic" Sprinkler Corp. of America—"The A B C of Fire Protection" deals with the economics of fire protection, available types of automatic fire extinguishing systems and representative installations for various types of fire hazards. Tables cover applications and functions of fire protection systems as well as alarm and control systems.

83. How Much Flow?

Bristol Co.—If any of your processes deal with flow of water, sewage, industrial plant effluent or other liquids through weirs or flumes, you'll find some useful data in illustrated bulletin F1606 on the Series 500 open channel flow meters.

84. Be a Hep Copycat

Charles Bruning Co.—Practically anything drawn, written, typed or printed can be reproduced quickly and easily by the Copyflex process. There's no fuss or bother to using a Copyflex machine. The how's and why's are shown in 8-page illustrated bulletin A-2008.

85. Move It Overhead

Cleveland Crane & Engineering Co., Cleveland Tramrail Div.—"Engineering and Application Data" is title of 12-page illustrated manual that outlines advantages of Cleveland Tramrail systems. Details of design, hand and motor carriers, cranes, transfer bridges, buckets, grabs and many other overhead materials handling units are included.

EDITORIAL REPRINTS:

86. Strategic Metals

In STEEL reprint entitled "Minor Metals Are Major Issue" J. L. Bray, Purdue professor of Metallurgical Engineering, sounds an alarm on the distressing shortage of uncommon metals that have become strategic since World War II. He discusses relative sources and supplies of nickel, chromium, cobalt, tungsten, columbium, tantalum, titanium, cermets and germanium.

87. Standard Fastener Sizes

"Fastener Sizes Standardized" is brief STEEL reprint which reports on recent standardization of square and hexagon bolt and nut sizes by the American Standards Association. Table shows comparison of old and new dimensions of light and regular series bolts and nuts.

88. Steel Industry

The 27th annual financial analysis of the Steel Industry for 1951 as compared to 1950 which was a supplement to STEEL magazine is available in reprint form. This special report is compiled from data received from 30 producers, representing 95.4 per cent of the steelmaking capacity in the U. S. and is headlined "Record Output Couldn't Offset Flow from Taxes."

89. Cemented Carbide

Physical and chemical properties of cemented chrome and titanium carbides which combine hardness, corrosion and heat resistance with lightweight are tabulated and discussed in brief STEEL reprint "Cemented Carbide Families Grow." Some new developments and uses are considered.

90. Planned Research

A well organized research program for the small or medium-sized business is the best health insurance available, according to M. J. Hiler of Commenwealth Engineering Co. In STEEL reprint "Planned Research —Profitable Business Insurance" author outlines research objectives and points to the technical audit service as the best means of analyzing a company's competitive position.

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6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
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has tensile strength of steel, withstands continuous exposure to temperatures up to 350° F. It is easy to machine, saw, drill, stamp, nail, glue.

Variable Transformer

USE REPLY CARD—CIRCLE No. 25

Powerstat type 10 variable transformer, introduced by Superior Electric Co., Bristol, Conn., is rated 120 v, 60 cycles, single phase input with an output of 0-120/132 v, 1.25 amp, 150/165 va. It is designed for 50, 100 and 150-w applications.

Positive-Action Belt Trainer

USE REPLY CARD—CIRCLE No. 26

Rapids-Standard Co. Inc., Grand Rapids, Mich., offers a positive-action belt trainer that automatically keeps wandering conveyor belts aligned. It eliminates wear, downtime and extra maintenance costs caused by creeping belts.

Binds Abrasives to Wheels

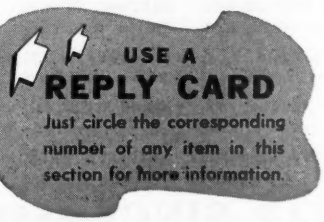
USE REPLY CARD—CIRCLE No. 27

Hanson - Van Winkle - Munning Co. Matawan, N. J., announces an improved high strength glue compound for binding abrasive to surface of metal polishing wheels. Known as Belgrade glue, it has improved water absorption qualities, proper viscosity, flexibility and strength characteristics required to prevent abrasive from tearing loose while wheel is in operation.

Stainless Fog Nozzles

USE REPLY CARD—CIRCLE No. 28

All stainless steel fixed installation fog nozzles for industrial processing and fire protection are announced by Bete Fog Nozzle Inc., Greenfield, Mass. Designated AA series, they are smaller in size and lighter in weight than previous models. They feature a patented spiral principle of atomization. Nozzles are available in six models.



Picked from the Plant Waste Barrel!

It sounds unbelievable, but it's true! A small piece of scrap abrasive belting can help you make production savings of 50% *and more.*

Given a letter-size sample of a used abrasive belt (preferably with joint included), picked at random from your plant waste barrel, experienced Jewel Brand Abrasive Engineers can usually recommend a Jewel Brand Belt that will do a better finishing job, faster, easier and at a much lower cost to you.

Numerous "waste barrel" tests have proved that the replacement of previous abrasives with longer-wearing, faster-cutting Jewel Brand Belts brings an immediate increase in productivity. Recent results show that the careful selection of a proper Jewel Brand Belt generally results in record-breaking production savings on a wide variety of polishing and grinding operations.

Try the easy, profitable waste barrel test now. Simply send us your used belt sample, together with completed coupon, and we'll do the rest . . . at no obligation to you.

ABRASIVE PRODUCTS, INC.
511 Pearl Street
South Braintree 85, Mass.

Yes, I wish to complete the Waste Barrel Test! Enclosed is a sample of used belt from our plant.

NAME _____ POSITION _____

COMPANY _____

ADDRESS _____

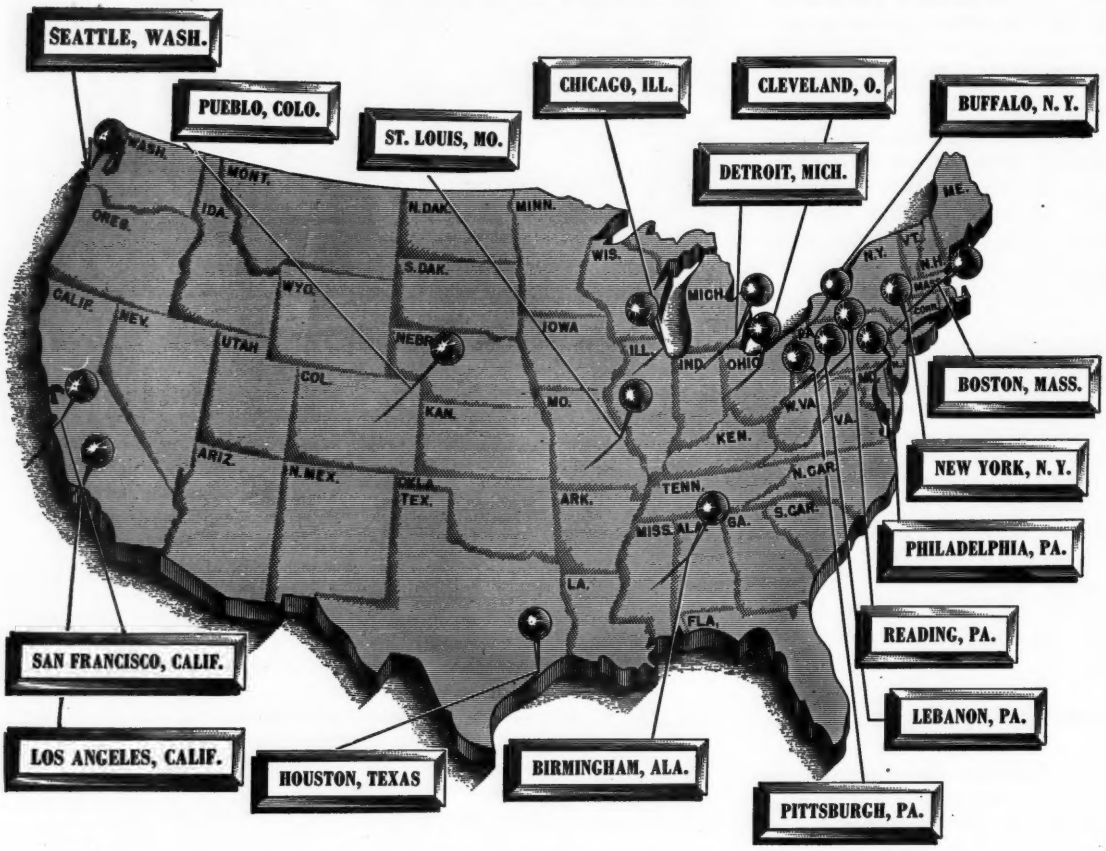
TYPE OF PRODUCTS _____ MATERIAL _____

WE USE APPROXIMATELY _____ BELTS PER MONTH _____

BELT LENGTH _____ BELT WIDTH _____

For the Purchase or Sale of Iron and Steel Scrap . . .

CONSULT OUR NEAREST OFFICE



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READING, PENNA.
DETROIT (ECORSE), MICHIGAN
MODENA, PENNA.
PITTSBURGH, PENNA.
ERIE, PENNA.

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LINCOLN-LIBERTY BLDG.
Philadelphia 7, Penna.

OFFICES

BIRMINGHAM, ALA.
Empire Building

BOSTON, MASS.
Statler Building

BUFFALO, N. Y.
Genesee Building

CHICAGO, ILLINOIS
100 W. Monroe St.

CLEVELAND, OHIO
1022 Midland Bldg.

DETROIT, MICH.
2011 Book Building

HOUSTON, TEXAS
1114 Texas Av. Bldg.

LEBANON, PENNA.
Luria Building

LOS ANGELES, CAL.
3440 Wilshire Blvd.

NEW YORK, N. Y.
100 Park Avenue

PITTSBURGH, PA.
Oliver Building

PUEBLO, COLORADO
334 Colorado Bldg.

READING, PENNA.
Luria Building

ST. LOUIS, MO.
Railway Exch. Bldg.

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SEATTLE, WASH.
Smith Tower

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

The Market Outlook

THE DAY of plenty of steel for all was shoved further into the future by the steelworkers' strike. This means you'll have to live longer with government controls.

How much the day of plenty and the demise of controls is postponed depends on how much the strike affects the economy.

The steel supply has a hard time getting fully caught up with demand. Each time the supply gets reasonably close to a balance with demand, there's an interruption. In 1950 when it appeared steel supply was just about in line with demand, the outbreak of the Korean war touched off a buying spree. The steel industry had just about worked out from under this load when a strike threat a month ago cut steel production sharply. Last week just as the industry got operations back up to capacity levels it was hit by a steelworkers' strike.

PREMATURE?—While supply of some products, notably bars and heavy plates, was still extremely short, the overall balance of supply and demand was near enough that the steel industry was working on a plan for complete decontrol of steel distribution. This plan differs sharply from the National Production Authority's mere loosening of controls.

This aggressive action by the industry was being taken to counteract opinion of some congressmen that modified controls should remain on steel.

The industry's proposal probably would be that first the ticket system be abandoned progressively, freeing consumers to use the available supply of steel as they wish. Then, control over the quantities of each steel product which can be turned out would be abandoned.

INCENTIVE—The industry feared that continuation of controls would hamper civilian durable goods production sufficiently to necessitate a cutback in steel production.

Growth of consumers' inventories of steel contributed to the steel industry's interest in devising a plan to remove controls. This inventory situation provides a clue to a question that arose with the strike last week: How long can metalworking plants continue to operate?

In the last 14 months, 9 per cent of the steel shipped went into inventories, and just prior to the production interruption a month ago the steel tonnage in inventory and in process had reached the highest point in history, says an industry spokesman.

TIME LIMITS—Most metalworking plants had enough steel to run at least three weeks. Others, including the automobile producers, had around a four-week supply. But the auto companies, like many other manufacturers, are dependent to a considerable extent on parts suppliers. The supplier with the smallest steel inventory holds the key as to how long the plant he supplies can run.

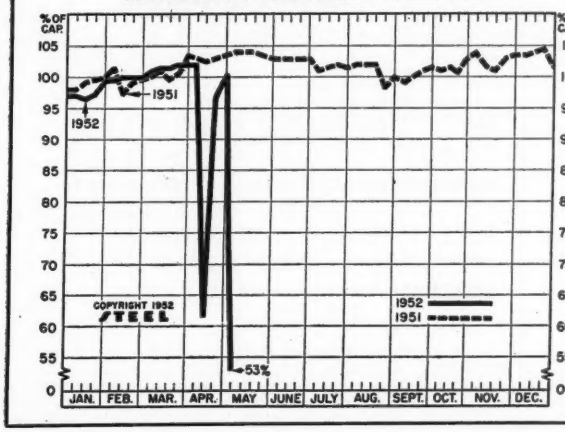
A few days before the steelworkers' strike started, the NPA announced it was preparing to remove second quality carbon steel from the list of controlled materials for the fourth quarter of this year.

CHANGE OF PACE—Further indication that the pinch on steel was easing before the strike is the report by the American Institute of Steel Construction that tonnage of fabricated structural steel ordered in March declined 3.5 per cent below that of February.

When the strike started the supply picture on other products was thus: Hot-rolled and cold-finished bars, particularly the larger sizes, were in the No. 1 tight spot. Heavy and wide plates were near the No. 1 tight spot. Strip mill plate was relatively easy. Hot-rolled carbon sheet demand was good. Cold-rolled carbon sheets, which had been in easy supply, were showing a pickup. Cold-rolled strip was in easy supply. Galvanized sheet supply was improving. Low silicon sheets were available for early delivery. Wire supply was plentiful and some users were cutting inventories further. Demand for smaller sizes of buttweld pipe had weakened.

The strike dropped steelmaking last week to 53 per cent of capacity, a 47.5-point decline.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended May 3†	Change	Same Week 1951	Same Week 1950
Pittsburgh	44.5	—58	101	100.5
Chicago	48	—53.5	106.5	105
Mid-Atlantic	70	—28	101	97
Youngstown	45	—60	104	107
Wheeling	90	—11.5	97.5	102.5
Cleveland	43.5	—55.5*	99.5	96
Buffalo	35	—69	104	104
Birmingham	44	—58	100	100
New England	35	—50	98	88
Cincinnati	60	—36	102	103
St. Louis	40	—52	92.5	82
Detroit	48	—64	105	102
Western	90	—13	104	93
Estimated national rate	53	—47.5	104	100.5

Based on weekly steelmaking capacity of 2,077,040 tons in 1952; 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950.

* Change from revised rate for preceding week. † Preliminary.

The Metalworking Outlook—p. 61 *Production-Engineering News—p. 97*

Composite Market Averages

FINISHED STEEL INDEX, Weighted:

	May 1 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	171.92†	171.92†	171.92†	171.92	118.67
Index in cents per lb.	4.657†	4.657†	4.657†	4.657	3.215

ARITHMETICAL PRICE COMPOSITES:

Finished Steel, NT	$106.32†	$106.32†	$106.32†	$106.32	$60.82
No. 2 Fdry, Pig Iron, GT	52.54	52.54	52.54	52.54	32.99
Basic Pig Iron, GT	52.16	52.16	52.16	52.16	32.49
Malleable Pig Iron, GT	53.27	53.27	53.27	53.27	33.71
Steelmaking Scrap, GT	43.00	43.00	43.00	44.00	31.33

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

† Primary, pending 1952 tin plate contract price announcement.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	May 1 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.70	2.60
Bars, H.R., Chicago	3.70	3.70	3.70	3.70	2.60
Bars, H.R., del. Philadelphia	4.223	4.223	4.223	4.20	2.98
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.55	3.20
Shapes, Std., Pittsburgh	3.65	3.65	3.65	3.65	2.50
Shapes, Std., Chicago	3.65	3.65	3.65	3.65	2.50
Shapes, del. Philadelphia	3.918	3.918	3.918	3.91	2.64
Plates, Pittsburgh	3.70	3.70	3.70	3.70	2.65
Plates, Chicago	3.70	3.70	3.70	3.70	2.65
Plates, Coatesville, Pa.	4.15	4.15	4.15	4.15	2.80
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.70	2.65
Plates, Claymont, Del.	4.15	4.15	4.15	4.15	2.80
Sheets, H.R., Pittsburgh	3.60–75	3.60–75	3.60–75	3.60–75	2.50
Sheets, H.R., Chicago	3.60	3.60	3.60	3.60	2.50
Sheets, C.R., Pittsburgh	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Chicago	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Detroit	4.55	4.55	4.55	4.55	3.35
Sheets, Galv., Pittsburgh	4.80	4.80	4.80	4.80	3.55
Strip, H.R., Pittsburgh	3.75-4.00	3.75-4.00	3.75-4.00	3.75-4.00	2.50
Strip, H.R., Chicago	3.50	3.50	3.50	3.50	2.50
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.65-5.35	3.20
Strip, C.R., Chicago	4.90	4.90	4.90	4.90	3.30
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-5.60	3.35
Wire, Basic, Pittsburgh	4.85-5.10	4.85-5.10	4.85-5.10	4.85-5.10	3.425
Nails, Wire, Pittsburgh	5.90-6.20	5.90-6.20	5.90-6.20	5.90-6.20	4.125
Tin plate box, Pittsburgh	$8.70	$8.70	$8.70	$8.70	$5.75

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$66.00	$50.00
Wire rods, ¼"-⅝", Pitts.	4.10–30	4.10–30	4.10–30	4.10–30	2.55

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$53.00	$34.00
Basic, Valley	52.00	52.00	52.00	52.00	33.00
Basic, del. Phila.	56.61	56.61	56.61	56.49	35.52
No. 2 Fdry, Pitts.	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	52.50	33.00
No. 2 Fdry, Valley	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, del. Phila.	57.11	57.11	57.11	56.99	36.02
No. 2 Fdry, Birm.	48.88	48.88	48.88	48.88	29.88
No. 2 Fdry (Birm.) del. Cin.	55.49	55.49	55.49	55.33	34.75
Malleable, Valley	52.50	52.50	52.50	52.50	33.50
Malleable, Chicago	52.50	52.50	52.50	52.50	33.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	66.00	40.50
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	188.00	140.25*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts.	$44.00	$44.00	$44.00	$45.00	$32.25
No. 1 Heavy Melt, E. Pa.	42.50	42.50	42.50	43.50	30.50
No. 1 Heavy Melt, Chicago	42.50	42.50	42.50	43.50	31.25
No. 1 Heavy Melt, Valley	44.00	44.00	44.00	45.00	32.00
No. 1 Heavy Melt, Cleve.	43.00	43.00	43.00	44.00	31.50
No. 1 Heavy Melt, Buffalo	43.00	43.00	43.00	44.00	31.00
Rails, Rerolling, Chicago	52.50	52.50	52.50	52.50	36.50
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	49.00*	42.50

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$8.75–9.50
Beehive, Fdry, Connlsvl.	17.50	17.50	17.50	17.50	9.75–11.00
Oven Fdry, Chicago	23.00	23.00	23.00	21.00	15.10

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	21.50
Zinc, E. St. Louis	19.50	19.50	19.50	17.50	10.50
Lead, St. Louis	17.80	18.80	18.80	16.80	14.80-11.85
Tin, New York	121.50	121.50	121.50	142.00	80.00
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex.	44.00	50.00	50.00	42.00	33.00
Nickel, refinery, duty paid	56.50	56.50	56.50	50.50	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	59.18	59.68	....
Newark, del.	56.87	57.37	57.87	58.37
Philadelphia, del.	56.61	57.11	57.61	58.11
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester, N.Y., del.	54.88	55.38	55.88	....
Syracuse, N.Y., del.	55.91	56.41	56.91	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
Indiana Harbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill. Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon, Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	59.75	60.25	....
Fontana, Calif. K1	58.00	58.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
Los Angeles, San Francisco, del.	60.16	60.66	....	....
Granite City, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
Geneva, Utah C11	52.00	52.50	....	....
Lone Star, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKees Rocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50c manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

Niagara Falls, N.Y. P15	$88.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2.	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2.	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.37
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, May 1, 1952; cents per pound except as otherwise noted. Changes shown in Italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$79.00
Munhall,Pa. U5 .....52.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairfield,Ala. T2 .....56.00
Fontana,Calif. K1 ....75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y. B2 ..56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 ....56.00
So.Duquesne,Pa. U5 ...56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3 ..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 .....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. U5 .....66.00
Geneva,Utah C11 .....66.00
Houston S5 .....74.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2,U5,W14..66.00
So.Duquesne,Pa. U5 ..66.00
So.SanFrancisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O.(29) T7 ....66.00
Conshohocken,Pa. A3 ..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston S5 .....78.00
Ind.Harbor,Ind. Y1 ...70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2 ..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14..70.00
So.Duquesne,Pa. U5 ..70.00
Struthers,O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ...103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago, Ill. R2 ...82.00
So.Duquesne,Pa. U5 ...82.00

SHEET BARS (NT)
Fontana,Calif. K1 ...$89.00

SKELP
Aliquippa,Pa. J5 .....$3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown R2, U5 ....3.35

WIRE RODS
Alton,Ill. L1 .....4.40
AlabamaCity,Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.90
Houston S5 .....4.50
Johnstown,Pa. B2 ....4.10
Joliet,Ill. A7 .....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ....4.35
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y. B11.4.10
Pittsburg,Calif. C11 ...4.75
Portsmouth,O. P12 ....4.30
Roebling,N.J. R5 .....4.20
So.Chicago,Ill. R2 .....4.10
SparrowsPoint,Md. B2 ..4.20
Sterling,Ill.(1) N15 ....4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ....4.90
Worcester,Mass. A7 ....4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2 ...4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 ....4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 .....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah C11 .....3.65
Houston S5 .....4.05
Ind.Harbor,Ind. I-2 ....3.65
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.25
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 .....4.85
Phoenixville,Pa. P4 ....5.90
Portland,Oreg. O4 .....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5 W14..3.65
So.SanFrancisco B3 ....4.20
Torrance,Calif. C11 ....4.25
Weirton,W.Va. W6 .....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 .....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 .....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2 ..5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 .....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Ind.Harbor,Ind. I-2 ....5.50
Ind.Harbor,Ind. Y1 .....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 .....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fontana,Calif. K1 .....4.65
Lackawanna,N.Y. B2 ..3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

H.S., LA. Wide Flange
Aliquippa,Pa. J5 .....5.50
Lackawanna,N.Y. B2 ....5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 .....5.45

BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala. T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ..5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1 ..6.25
Gary,Ind. U5 .....5.65
Geneva,Utah C11 .....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y1 .....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.65
SparrowsPoint,Md. B2 ..5.65
Warren,O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ....4.85
Coatesville,Pa. L7 .....5.25
Conshohocken,Pa. A3 ..5.05
Fontana,Calif. K1 .....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 .....4.75
SparrowsPoint,Md. B2 ..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ..4.75
Ind.Harbor,Ind. I-2 ....4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 .....4.75

PLATES, Ingot Iron
Ashland,c.l. (15) A10 ..3.95
Ashland,l.c.l. (15) A10 .4.45
Cleveland,c.l. R2 .....4.30
Warren,O.c.l. R2 .....4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky. (15) A10 ..3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. C22 .....4.15
Cleveland J5, R2 .....3.70
Coatesville,Pa. L7 .....4.15
Conshohocken,Pa. A3 ..4.15
Fairfield,Ala. T2 .....3.70
Fontana,Calif.(30) K1 ..4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 .....4.40
Geneva,Utah C11 .....3.70
Harrisburg,Pa. C5 .....6.30
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5 W14..3.70
SparrowsPoint,Md. B2 ..3.70
Steubenville,O. W10 ....3.70
Warren,O. R2 .....3.70
Weirton,W.Va. W6 .....4.00
Youngstown R2, U5, Y1.3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.45
Geneva,Utah C11 .....4.85

PLATES, Wrought Iron
Economy,Pa. B14 .....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill. L1 .....4.15
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11..3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 .....4.40
Weirton,W.Va. W6 .....3.85
So.Chicago R2, U5, W14.3.70
So.Duquesne,Pa. U5 ....3.70
So.SanFran.,Cal. B3 ....4.45
Youngstown R2, U5 ....3.70

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Niles,Calif. P1 .....5.05
Portland,Oreg. O4 .....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.30
Houston S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 .....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2, U5, W14.4.30
So.Duquesne,Pa. U5 ....4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary,Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. Y1 ..6.05
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 ....5.55
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....4.55
BeaverFalls,Pa. M12, R2 4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 .....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.55
Elyria,O. W8 .....4.55
FranklinPark,Ill. N5 ....4.55
Gary,Ind. R2 .....4.55
GreenBay,Wis. F7 .....4.55
Hammond,Ind. L2, M13.4.55
Hartford,Conn. R2 .....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 .....5.10
Massillon,O. R2, R8 .....4.55
Monaca,Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 .....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 .....5.10
Readville,Mass. C14 .....5.10
St.Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 .....4.55
SpringCity,Pa.(5) K3 ....5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 .....4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....5.40
BeaverFalls,Pa. M12 .....5.40
Bethlehem,Pa B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13 .5.40
Hartford,Conn. R2 .....5.85
Harvey,Ill. B5 .....5.40
Lackawanna,N.Y. B2 ..5.40
Mansfield,Mass. B5 ....5.85
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 .....5.60
So.Chicago,Ill. R2, W14.5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ....5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ...4.75
Chicago Hts.(3,4) I-2 ...4.75
Franklin,Pa.(3,4) F5 ...4.75
FortWorth,Tex.(26) T4..4.85
Huntngtn,W.Va.(3) W7 .5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda(3,4) B12 ...4.75
Williamsport(3) S19 ...5.00
Williamsport(4) S19 ...5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover(Eng.Bolt) U1 ..13.50
Dover(Wrght.Iron) U1 .12.25
Economy,Pa.(S.R.) B14 .9.60
Economy,Pa.(D.R.)B14 11.90
Economy(Staybolt) B14 12.20
McK.Rks.(Staybolt)L5 .14.50
McK.Rks.(S.R.) L5 ....9.60
McK.Rks.(D.R.) L5 ...13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ...3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.30
Lackawanna,N.Y. B2 ..3.70
Munhall,Pa. U5 .....3.70
Niles,O. N12 .....5.25
Pittsburg,Calif. C11 ....4.30
Pittsburgh J5 .....3.60
Sharon,Pa. S3 .....4.00
So.Chicago,Ill. W14 .....3.60
SparrowsPoint,Md. B2 ..3.60
Steubenville,O. W10 ....3.60
Torrance,Calif. C11 ....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 .....3.60
WestLeechburg,Pa. A4 ..3.75
Youngstown U5, Y1 ....3.60

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ..4.75
Dover,O. R1 .....5.65
Ind.Harbor,Ind. I-2 ....5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 ....5.40

SHEETS, H.R. (14 ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ...5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 ....5.40
Ind.Harbor,Ind. Y1 .....5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 ....5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 .....5.40
SparrowsPoint(36) B2 ..5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 .....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....6.65
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1..7.05
IndianaHarbor,Ind. I-2..6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 ....6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2 ..6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 .....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Gal'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torranee,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23) F4	6.85

SHEETS, Enameling Iron

Ashland,Ky(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O W10	6.15

SHEETS, Culvert No. 16

	Cu	Cu
	Alloy	Fe
Ashland,Ky. A10.	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2.	5.60	5.85
Gary,Ind. U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16.	6.25	...
MartinsFy,O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths).	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	...	6.75	7.25	...
Vandergrift,Pa. U5	...	...	7.25	7.75	9.00
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	...	7.25	7.75	9.00

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5.	$8.45	$8.70
Fairfield,Ala. T2.	8.55	8.80
Gary,Ind. U5....	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11 ...	9.20	9.45
Sp.Pt.,Md. B2 ..	8.55	8.80
Warren,O. R2 ..	8.45	8.70
Weirton,W.Va.W6	8.45	8.70
Yorkville,O. W10.	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2.	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEET, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEET, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O A10	5.60

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb., Ind. I-2	5.30
IndianaHarbor,Ind. Y1.	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles (25) B3	6.05
Seattle B3	6.30
Sharon, Pa. S3	5.40
So.SanFrancisco(25) B3.	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W. Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1.	3.50
Johnstown,Pa.(25) B2.	3.50
KansasCity,Mo.(9) S5.	4.10
Lackawanna,N.Y.(32)B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md B2	3.50
Torrance,Calif. C11	4.25
Waren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston, Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	5.45
Sharon,Pa S3	5.85
Youngstown U5	5.50

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40)T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle,Pa.(40) E5.	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8.	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	....	....
Detroit D2	5.60	6.65	7.25	...	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	....
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8:					
Cleve.orPitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Mass.,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester, Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30	12.50	15.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Bacock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire

G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Jonhson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)	$15 10.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60
NewBritn,Conn.(10)	$15 10.75
Pawtucket,R.I.(11)	N8. 10.75
Pawtucket,R.I.(12)	N8. 11.05
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.30
Youngstown C8	10.60

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.75
Warren,O. R2	4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.25

TIGHT COOPERAGE HOOP

Atlanta A11	4.05
Riverdale,Ill. A1	3.90
Sharon,Pa. S3	4.15
Youngstown U5	3.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling,N.J. R5	11.55

WIRE, Merchant Quality

	An'ld (6 to 8 gage)	Galv.
AlabamaCity R2.	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19)K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora,Pa. A7	5.70	6.15
Duluth,Minn. A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.06
LosAngeles B3	6.65	...
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts.,Calif. C11	6.65	6.80
Portsmth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	6.95
So.S.Fran. C10	6.65	7.10
SparrowsPt, B2	5.80	6.25
Sterling,Ill.(1)	N15 5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

ROPE WIRE

	(A)	(B)
Alton,Ill. L1	8.65	8.90
Bartonville,Ill. K4	8.55	8.80
BuffaloW12	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7.	8.80	9.05
Muncie,Ind. I-7	8.75	9.00
Palmer,Mass. W12.	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5.	8.85	9.10
SparrowsPt. B2..	8.65	8.90
Struthers,O. Y1..	8.55	8.80
Worcester J4, T6.	8.85	9.10

(A) Plow and Mild Plow
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill. L1	5.05
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	5.10
Cleveland A7, C20	4.85
Crawfordsville,Ind. M8.	5.10
Donora,Pa. A7	4.85
Duluth,Minn. A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S5	5.25
Johnstown,Pa. B2	4.85
Joliet,Ill. A7	4.85
KansasCity,Mo. S5	5.45
Kokomo,Ind. C16	4.95
LosAngeles B3	5.80
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark 6-8 ga. I-1	5.50
No.Tonawanda B11	4.85
Palmer,Mass. W12	5.15
Pittsburg,Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin,Pa. A7	4.85
So.Chicago,Ill. R2	4.85
So.SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.95
Sterling,Ill.(1) N15	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill. A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. M8.	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
FranklinPark,Ill. T6	6.20
Massillon,O. R5	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) N8.	6.85
Trenton,N.J. R5	6.15
Worcester,Mass. A7	6.15
Worcester,Mass. T6	6.50
Worcester,Mass. W12	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.50
Monessen,Pa. P16	8.50
Muncie,Ind. I-7	8.70
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2.	8.60
Johnstown,Pa. B2	8.50

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(1)K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsville M8.	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass.W12.	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prismth.(18) P12.	10.55	12.30
SparrowsPt. B2.	10.35	12.25
Waukegan A7	10.25	12.15

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.25
Alton,Ill. L1	6.45
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth,Minn. A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Milbury,Mass(12) N6.	8.05
Monessen,Pa. P7, P16.	6.25
Muncie,Ind. I-7	6.45
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling,N.J. R5	6.55
Portsmouth,O. P12	6.25
So.Chicago,Ill. R2	6.25
So.SanFrancisco C10	7.20
SparrowsPoint,Md. B2.	6.35
Struthers,O. Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12.	6.55
Worcester,Mass. J4	6.75

WIRE, Fine & Weaving (8"Coils)

Bartonville,Ill.(1) K4	8.90
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville,Ind. M8.	8.95
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.90
Monessen,Pa. P16	8.90
Muncie,Ind. I-7	9.10
Palmer,Mass. W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill. A7	8.90
Worcester,Mass. A7, T6.	9.20

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	141
Atlanta A11	144
Bartonville,Ill.(19) K4	144
Crawfordsville,Ind. M8.	146
Donora,Pa. A7	141
Duluth,Minn. A7	141
Fairfield,Ala. T2	141
Houston,Tex. S5	149
Johnstown,Pa. B2	141
Joliet,Ill. A7	141
KansasCity,Mo. S5	153
Kokomo,Ind. C16	143
Minnequa,Colo. C10	147
Monessen,Pa. P7	146
Pittsburg,Calif. C11	161
Portsmouth,O.(18) P12.	148
Rankin,Pa. A7	141
So.Chicago,Ill. R2	137
So.SanFran.,Calif. C10.	161
SparrowsPoint,Md. B2	143
Sterling,Ill.(1) N15	141

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Crawfordsville,Ind. M8	132
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburg,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.90
Alton, Ill. L1	6.10
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth,Minn. A7	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
So.SanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	6.85
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½Ga.

	Col.
AlabamaCity,Ala. R2	127
Ala.City,Ala.,17-18ga.R2	214
Aliquippa,Pa.9-14½ga.J5	131
Atlanta A11	134
Bartonville,Ill.(19) K4	131
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Johnstown,17ga.,6" B2.	205
Johnstown,17ga.,4" B2.	208
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	139
Monessen,Pa. P7	136
Pittsburg,Calif. C11	154
Portsmouth,O.(18) P12	138
Rankin,Pa. A7	131
So.Chicago,Ill. R2	127
Sterling,Ill.(1) N15	131

FENCE POSTS

ChicagoHts.,Ill. C2	140
Duluth,Minn. A7	125
Franklin,Pa. F3	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R3	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	140
Williamsport,Pa. S19	150

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(31) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.35

RAILS

	Std. No. 1	Std. No. 2	All	60 lb	Tee Rails Under 60 lb
Bessemer,Pa. U5	3.60	3.50	3.55		4.00
Ensley,Ala. T2	3.60	3.50	...		4.00
Fairfield,Ala. T2	...	...	...		4.00
Gary,Ind. U5	3.60	3.50	3.55		...
Huntington,W.Va. W7	...	...	...		5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55		...
Johnstown,Pa. B2	...	...	...	(16)	4.00
Lackawanna,N.Y. B2	3.60	3.50	...		4.00
Minnequa,Colo. C10	3.60	3.50	...		4.50
Steelton,Pa. B2	3.60	3.50	...		...
Williamsport,Pa. S19	...	...	...		4.75

NAILS & STAPLES, Stock

To dealers & mfrs.(7)	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa.(13) J5	118
Atlanta A11	121
Bartonvill,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. M8	122
Donora,Pa. A7	118
Duluth, Minn. A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. 10	7.35

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind, U5	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1.	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.65
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

AXLES

Ind.Harbor,Ind. S13	5.60
Johnstown,Pa. B2	5.60

TOOL STEEL

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	
18	4	1	....	1.505
18	4	2	....	1.650
20.25	4.25	1.6	12.25	3.535-3.675
19	4	2	7	2.460
18.25	4.25	1	4.75	2.125
18	4	2	9	2.445-2.45
13.5	4	3	....	1.6025

W	Cr	V	Mo	
6.4	4.5	1.9	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes:
(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cnts. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared: add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035": 0.035" and heavier, 0.25c higher.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O8 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P8 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RellanceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

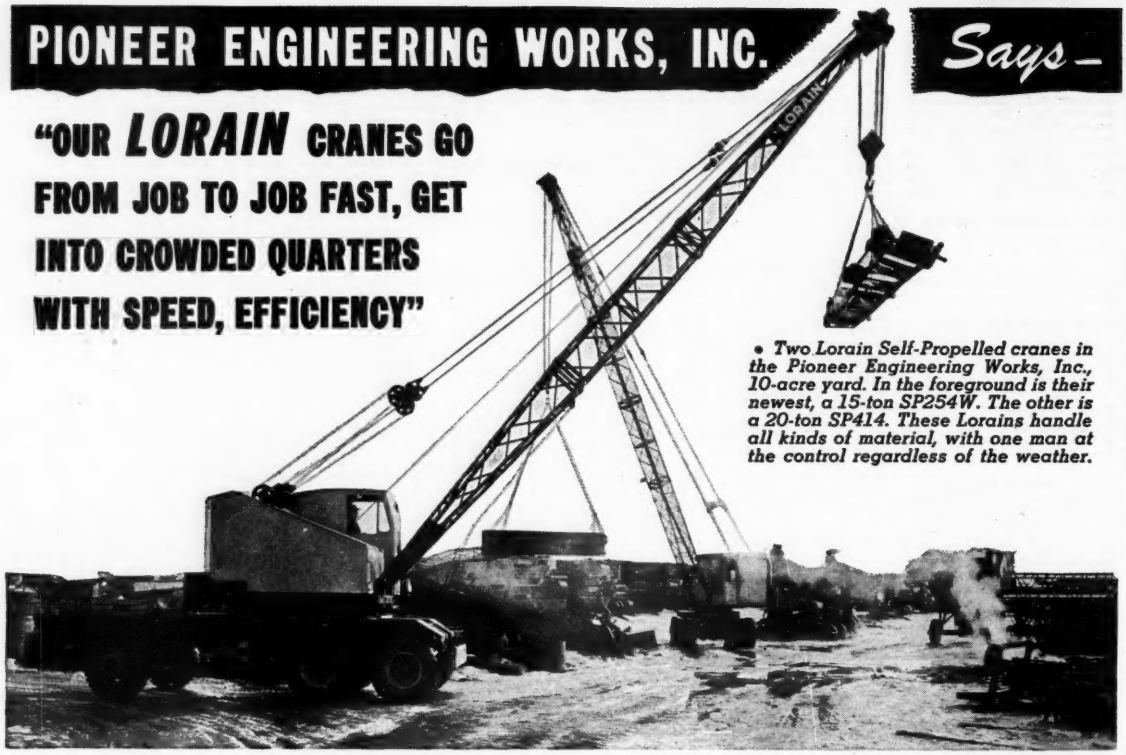
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 YoungstownSheet&Tube

PIONEER ENGINEERING WORKS, INC. Says—

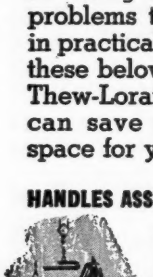
"OUR *LORAIN* CRANES GO FROM JOB TO JOB FAST, GET INTO CROWDED QUARTERS WITH SPEED, EFFICIENCY"



• *Two Lorain Self-Propelled cranes in the Pioneer Engineering Works, Inc., 10-acre yard. In the foreground is their newest, a 15-ton SP254W. The other is a 20-ton SP414. These Lorains handle all kinds of material, with one man at the control regardless of the weather.*

At progressive Pioneer Engineering Works, Inc., Minneapolis, Minn., two Lorain Self-Propelled cranes have put storage yard operations on a "mass production" basis. In doing this, Pioneer has solved three problems that apply to material handling in practically every industrial plant. Check these below . . . and, too, check with your Thew-Lorain distributor on how a Lorain can save money, manpower and yard space for you!

HANDLES ASSEMBLY PARTS OR FINISHED PRODUCT...



As shown above, the two Lorain cranes are performing different functions. In the foreground, a large conveyor part is on its way to the *assembly plant.* The other crane is placing a heavy roll crusher base in yard stock for *storage.* Size, shape and weight mean nothing to a Lorain because there are more than 16 lifting attachments for handling any type of material and capacities up to 45 tons.

FAST MOVES...IN A BUSY YARD—CRAMPED QUARTERS

Pioneer shipping foreman — traffic manager, G. W. Lundberg — reports, "Our yard is crowded and busy, the crane goes from job to job fast, gets into cramped quarters without unusual difficulty and handles the loads with speed and efficiency." If you want a fast-moving, time-saving crane for your yard, put a Lorain rubber tire crane to work.

FEWER AISLES . . . MORE STORAGE SPACE . . .

Notice the long booms on these 2 Lorains at Pioneer. Lorain cranes have the lifting capacities to reach high, wide and handsome over stockpiles, lifting and placing heavy loads. As a result, fewer access aisles are needed . . . stock is piled higher . . . valuable storage space is saved.

In addition to Lorains on rubber, you can select from a complete line of crawler mountings to fit your plant needs. Investigate this modern material handling method today!

THE THEW SHOVEL CO., LORAIN, OHIO

STANDARD PIPE, T & C

BUTTWELD Size	List	Pounds	Carload Discounts from List, % —Black—			—Galvanized—		
Inches	Per Ft	Per Ft	A	B	C	D	E	F
⅛	5.5c	0.24	34.0	32.0	...	+0.5	+2.5	...
¼	6.0	0.42	28.5	26.5	...	+3.5	+5.5	...
⅜	6.0	0.57	23.5	21.5	...	+10.0	+12.0	...
½	8.5	0.85	36.0	34.0	35.0	12.0	10.0	11.0
¾	11.5	1.18	39.0	37.0	38.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	42.0	40.0	41.0	20.5	18.5	19.5
1½	27.5	2.78	42.5	40.5	41.5	21.5	19.5	20.5
2	37	3.68	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	22.0

Column A: Etna, Pa. N2 and 36½ % on 3½", 4"; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜"; Wheatland, Pa. W9, 2 points lower on ⅛", ¼", ⅜".. Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼ % on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., Y1; Alton, Ill., (Gary base) 2 points lower discount L1.

Column D: Butler, Pa. F6, ⅛-⅜": Benwood, W. Va. W10, except plus 4% on ⅛", plus 6% on ¼", plus 13% on ⅜" and 15.5% on 3½", 4"; Sharon, Pa. M6, plus 2.5 on ⅛", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3"; Wheatland, Pa. W9, add 2 points on ⅛", ¼", ⅜", 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½", 3". Etna, Pa. N2 and 15.5% on 3½", 4". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 15½ % on 3½" and 4"; Youngstown Y1, Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½" and 3".

SEAMLESS AND ELECTRIC WELD Size	List	Pounds	Carload Discounts from List, % Seamless Black	Seamless Galv.	Elec. Weld Black	Elec. Weld Galv.
Inches	Per Ft	Per Ft	A	B	C	D
2	37.0c	3.68	29.5	8.0	29.5	8.0
2½	58.5	5.82	32.5	11.5	32.5	11.5
3	76.5	7.62	32.5	11.5	32.5	11.5
3½	92.0	9.20	34.5	13.5	34.5	13.5
4	$1.09	10.89	34.5	13.5	34.5	13.5
5	1.48	14.81	37.0	16.0	37.0	16.0
6	1.92	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6-in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D.	B.W.	—Seamless—		Elec. Weld	
In.	Ga.	H.R.	C.D.	H.R.	C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2½	12	26.92	32.97	26.98	31.76
2¾	12	29.65	36.32	29.57	34.76
2⅞	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	—Plates— Carbon Base 10%	20%	—Strip— Cold-Rolled Carbon Base Both Sides	—Sheets— Carbon Base 10%	Both Sides 20%	Cu Base Both Sides
302 ...	....	....	....	19.75	26.24–27.50	77.00
304 ...	25.00	29.50	....	24.50	27.50–27.77	77.00
309 ...	30.50	35.00	....	....	....	....
310 ...	36.50	41.00	....	....	....	144.00
316 ...	29.50	34.00	....	26.00	35.92–36.50	....
317 ...	34.50	39.00	....	....	....	....
318 ...	33.50	38.00	....	....	....	....
321 ...	26.50	31.00–32.00	....	23.00	33.00	111.00
347 ...	27.50	32.00	....	24.00	33.50–33.83	130.00
405 ...	21.25	27.75	....	....	....	....
410 ...	20.75	27.25	....	....	....	....
Nickel.	33.55	45.15	41.00	54.00	....	....
Inconel.	41.23	54.18	....	....	....	165.00
Monel.	34.93	46.28	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:

½-in. & smaller diam.	15
⅝-in. & ⅞-in.	18.5
1-in. and larger ...	17.5

Longer than 6 in.:

All diams.	14

Lag bolts, all diams.:

6 in. and shorter ...	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up Bolts	31

NUTS

	H.P. & C.P. Reg.	Hvy.
Square:		
½-in. & smaler	15	15
⅝-in. & ⅞-in..	12	6.5
¾-in.-1½-in. ..	9	1
1⅛-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅞-in..	16.5	6.5
¾-in.-1½-in. ..	12	2
1⅛-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅞-in..	23	17.5
¾-in. & 1½-in.	19.5	12
1⅛-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaler..	35	28.5
⅝-in. & ⅞-in. ..	29.5	22
¾-in.-1½-in.	24	15
1⅛-in. & larger..	13	8.5
		Light
⅞-in. & smaller		35
½-in. to ⅞-in.		28.5
¾-in. to 1½-in.		26

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish .....48 &	10
Plated finishes ....31 &	10

HEXAGON CAP SCREWS

(1020 steel; packaged: per cent off list)

6 in. or shorter:

⅝-in. & smaller	42
¾-in. through 1 in..	34

Longer than 6 in.:

⅝-in. & smaller ...	26
¾-in. through 1 in...	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged: per cent off list)

No. 10 and smaller ...	35
¼-in. diam. & larger..	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger	7.85c
7/16-in. under	36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers..List to list-plus $1

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

—Inches— Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
	CARBON	
35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	41.00	34.00	31.25
302...	41.25	36.75	31.50
303...	43.25	40.25	34.00
304...	43.25	38.75	33.00
309...	56.00	55.00	44.75
316...	57.00	59.00	49.25
321...	49.25	48.25	37.00
347...	53.75	52.25	41.50
410...	36.50	30.50	25.75
416...	37.00	37.00	26.25
420...	44.00	47.00	31.25
430...	39.00	31.00	26.25
501...	27.50	26.00	14.25
502...	28.50	27.00	15.25

Balt., Types 301-347 sheet, except 303 and 309 E2.

Brackenridge, Pa., Sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Muncie, Ind., wire I-7 quotes types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416 501 and 502 and 34.25c on Type 301 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens	
Pure benzol 30.00-35.00	
Toluol, one deg...26.00-33.00	
Industrial xylol...25.00-33.50	
Per ton bulk ovens	
Sulphate of ammonia..$32-$45	
Cents per pound, ovens	
Phenol. 40 (carlots, non-returnable drums) ..17.25	

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron	Cents
98+% Fe, carlots..	17.00
Swedish, c.i.f. New York, in bags..8.85-9.95	
Electrolytic iron:	
Annealed, 99.5% Fe,	42.50
Unannealed 99 + % Fe)	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns..83.00-148.00	
Aluminum:	
Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	32.50
Antimony 75.85	
Brass, 20-ton lots..30.00-33.25	
Bronze, 10-ton lots	51.25-60.00
Phosphor - Copper, 20-ton lots 50.00	
Copper:	
Electrolytic	37.25
Reduced	33.75
Lead	26.30
Magnesium 75.00-85.00	
Manganese:	
Minus 100-mesh ...	57.00
Minus 35 mesh	52.00
Minus 200 mesh ...	62.00
Nickel unannealed ...	86.00
Nickel-Silver 5-ton lots	45.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302 ...	83.00
Zinc, 10-ton lots..25.00-32.50	
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over ..	6.00
Less than 1000 lb..	6.15
98.8% minus 65 mesh:	
1000 lb and over ..	4.15
Less than 1000 lb..	4.25
Molybdenum:	
99.9%, minus 200 mesh	3.24
Chromium, electrolytic 99% Cr. min.	3.50

METALLURGICAL COKE

Price net net ton

BEEHIVE OVENS

Connellsvll.fur.	.$14.50-15.00
Connellsvll.fdy.	..17.00-18.00
New River foundry	...21.30
Wise county, foundry	..15.95
Wise county, furnace	..15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	..$22.75
Everett, Mass., ovens New England, del.	*24.80
Chicago ovens	23.00
Chicago, del.	24.50
Terre Haute, ovens	...22.50
Milwaukee, ovens	....23.75
Indianapolis, ovens	...22.75
Chicago, del.	26.42
Cincinnati, del.	25.85
Detroit, del.	26.85
Ironton, O., ovens	....22.50
Cincinnati, del.	25.12
Painesville, O., ovens	..24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens	....20.30
Birmingham, del. ...	21.60
Philadelphia, ovens	...22.70
NevilleIsland,Pa.,ovens	23.00
Swedeland, Pa., ovens	22.60
St. Louis, ovens St. Louis, del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.89
Flint, del.	26.59
Pontiac, del.	25.47
Saginaw, del.	26.92

* Or within $4.15 freight zone from works.

Ever since you were knee-high to a hop-toad, you've heard about America's wonderful *natural resources*—the bountiful fertile fields, the towering timber growth, the boundless water power, and the untold wealth of gold, iron, oil, silver, coal and other natural treasures that lie buried in the ground.

Is it because America has *more* natural resources than any other country that Americans enjoy the world's highest standard of living? No—many countries have as much—some have more.

Then is it because Americans *do* more with what they've got?

Yes! And the reason is as plain as the nose on your face. It's because Americans are free to develop their natural resources—and their natural resourcefulness—in the wholesome climate of *open and strenuous COMPETITION.*

COMPETITION—not "regimentation"—is what eggs a man on to do his best.

COMPETITION—not government control—is what urges a business to give its customers ever greater value for their money.

So let's say "NO SALE" to the *ism* peddlers who would have us swap our U. S. A. system of free competition for their "planned" regimentation—trade our U. S. A. freedom and plenty for their serfdom and poverty!

* * *

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THE COMPETITIVE SYSTEM DELIVERS THE MOST TO THE GREATEST NUMBER

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡§		Carbon	Floor
New York (city)	6.39	7.11	8.55	7.05	...	6.49	7.29	9.28	6.37	6.74	7.98
JerseyCity(c'try)	6.10	6.91	8.25	6.75	...	6.19	6.99	10.48	6.07	6.44	7.68
Boston (city) ..	6.40	7.18	8.59	6.35	...	6.25	6.81	10.80	6.40	6.60	7.84
Boston (c'try) .	6.20	6.98	8.39	6.15	...	6.05	6.61	10.60	6.20	6.40	7.64
Phila. (city) ..	6.04	6.97	8.35	6.60	7.11	6.29	7.16	10.48	6.10	6.38	7.29
Phila. (c'try) .	5.79	6.72	8.10	6.35	6.86	6.04	6.91	10.23	5.85	6.13	7.04
Balt. (city) ...	5.74	7.00	8.40	6.23	...	6.21	6.83	...	6.33	6.33	7.57
Balt. (c'try) ..	5.54	6.80	8.20	6.03	...	6.01	6.63	...	6.13	6.13	7.37
Norfolk, Va. ..	6.78	...	...	...	...	6.04	7.30	...	6.30	6.30	7.15
Richmond, Va..	5.74	6.57	8.38	6.14	...	5.91	6.59	...	6.72	6.86	8.00
Wash. (w'hse) .	6.05	7.26	8.49	6.50	...	6.50	7.26	...	6.60	6.65	7.86
Buffalo (del.)..	5.74	6.52	8.43	6.30	...	5.72	6.65	10.63††	6.02	6.18	7.55
Buffalo (w'hse).	5.54	6.32	8.23	6.10	...	5.52	6.45	10.48††	5.82	5.98	7.35
Pitts. (w'hse) ..	5.50	6.32	7.85	5.59	6.90	5.45	6.15	10.30††	5.65	5.65	6.89
Detroit (w'hse).	5.76	6.50	8.47	6.15	7.15	5.74	6.64	10.45††	6.09	6.14	7.21
Cleveland (del.)	5.74	6.52	8.16	5.85	7.14	5.81	6.25	8.91	6.15	6.02	7.39
Cleve. (w'hse) .	5.54	6.32	7.96	5.65	6.94	5.61	6.15	8.71	5.95	5.82	7.19
Cincin. (w'hse).	5.79	6.03	8.24	5.72	...	5.70	6.59	10.44††	6.04	6.09	7.23
Chicago (city) .	5.74	6.52	8.05	5.69	...	5.67	6.25	10.30††	5.85	5.85	7.09
Chicago (w'hse)	5.54	6.32	7.85	5.49	...	5.47	6.05	10.10††	5.65	5.65	6.89
Milwau. (city) .	5.90	...	8.21	5.85	...	5.83	6.51	10.46††	6.01	6.01	7.25
Milwau. (c'try)	5.70	...	8.01	5.65	...	5.63	6.31	10.26††	5.81	5.81	7.05
St. Louis (del.)	6.02	6.80	8.33	5.97	...	5.95	6.63	10.58††	6.22	6.22	7.46
St. L. (w'hse) .	5.82	6.60	8.13	5.77	...	5.75	6.43	10.38††	6.02	6.02	7.26
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
Kans.City(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city).	5.75	6.55	6.90[3]	5.70	...	5.70	7.53	...	5.85	6.10	8.23
Birm'hm(w'hse)	5.60	6.40	6.75[2]	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city).	6.50	8.10[3]	9.05	6.60	10.65	6.45	8.35	11.50††	6.50	6.50	8.75
L. A. (w'hse)..	6.30	7.90[3]	8.85	6.40	10.45	6.25	8.15	11.30††	6.30	6.30	8.55
Seattle-Tacoma.	7.01	8.64	9.55	7.40	...	6.70	8.80	10.35	6.70	6.78	8.73
San Francisco..	6.59	7.88[3]	8.85[3]	6.43	...	6.45	8.20	11.15	6.25	6.50	8.50

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 16 gauge; †† as annealed; §§ 15 gage. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [4]—3500 lb and over; [5]—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports. After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates - contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	$20.00-24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)	30.00-31.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom.

Rhodesian

45% no ratio	$29.00
48% no ratio	31.50-32.00
48% 3:1 lump	50.00-51.00

Domestic—rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $75, Palmerton, Pa; $75, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $185 per gross ton of alloy, c.l. packed, $197; gross ton lots, packed, $212; less gross ton lots, packed $229; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Ashtabula, O. Base price: $187, Johnstown, Pa.; $185, Sheridan, Pa.; $188, Etna, Pa.; $186, Anaconda, Mont.

Shipment from Pacific Coast warehouses by one seller, add $33 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $227; less gross ton lots, $244, f.o.b. Chicago. Add or subtract $2.30 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 25.75c per lb of contained Mn, carload packed 26.5c ton lots 27.6c, less ton 28.8c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 0.5c to above prices. Spot, add 0.25c

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 19.15c per lb of contained Mn, carload packed 19.9c, ton lot 21.0c, less ton 22.2c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 34c per lb or metal; packed, 34.75c; ton lot 36.25c; less ton lots 38.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 40,000 lb or more, 28c; 2000 to 39,999 lb, 30c; 250 to 1999 lb, 32c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65 - 68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si 9.90c per lb of alloy, carload packed, 10.65c, ton lots 11.55c, less ton 12.55c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18% C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silicax Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton ton 49c. Deliverd.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal. Fe) Lump, carload bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Sigio, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo. f.o.b. Langeloth, $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth, Pa., $1.14, in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

NOTE: Current prices on chromium, silicon, vanadium, boron and tungsten alloys appeared on page 149, Apr. 21 issue; calcium zirconium and briquetted alloys, page 179, Apr. 14. Refractories prices also were published on page 179, Apr. 14 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

May 1	$43.00
Apr. 24	43.00
Apr. 1952	43.00
May, 1951	44.00
May, 1947	29.75

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	Grade 1 No. 1 Bundles, Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	−$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	−10.00
7. Mixed Borings and Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00

Cut Structurals & Plate:

16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base

Foundry, Steel:

20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00
31. Old Tin & Terne Plated Bundles	−10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries; or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 bundles less $15.00.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	−$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats.	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	−12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches.	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or/steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angles, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	−13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.

(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise, ceiling shall not exceed that for base grade (No. 1).

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.
(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3. For preparing into:
(4) Grade No. 25, $6.
(5) Grade No. 19, $6.
(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) Grade No. 17 or No. 21, $11.
(8) Grade No. 18, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.

For preparing into:

(3) Grade No. 16, $4.
(4) Grade No. 17, $5.
(5) Grade No. 18, $7.
(6) Grade No. 21, $4.
(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Premium for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery.	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.

(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

OPEN MARKET PRICES CAST SCRAP

Boston
(F.o.b. shipping point)

No. 1 cupola cast	$40.00
No. 1 machinery cast	45.00

San Francisco
(Delivered)

No. 1 cupola cast	42.00

Birmingham
(Delivered)

No. 1 cupola cast	42.00-43.00
Stove plate	38.00-39.00
Charging box cast	39.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-36.00

St. Louis
(Delivered)

No. 1 cupola	45.00
Stove plate	39.00
Unstripped motor blocks	35.00

Detroit
(Brokers' buying prices; f.o.b. shipping point)

No. 1 cupola cast	47.00
Heavy breakable	42.00
Clean auto cast	49.00-50.00
Unstripped motor blocks	38.00
Drop broken machinery.	49.00-50.00

Philadelphia
(Delivered)

No. 1 cupola cast	44.00-45.00
Unstripped motor blocks	40.00

New York
(F.o.b. shipping point)

Cupola cast	42.00-43.00
Unstripped motor blocks	35.00

Cleveland
(Delivered)

No. 1 cupola cast	44.00

Pittsburgh
(Delivered)

No. 1 cupola cast	46.00
Heavy breakable	45.00
Charging box cast	47.00

Buffalo
(Delivered)

No. 1 cupola cast	45.00

HAMILTON, ONT.
(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory: Prep'd	33.00
Unprep'd	31.00
Short Steel Turnings	32.00
Cast Iron Grades*	
No. 1 Machinery Cast	50.00

* F.O.B. shipping point.

For High Density Bales... Use Self-Contained

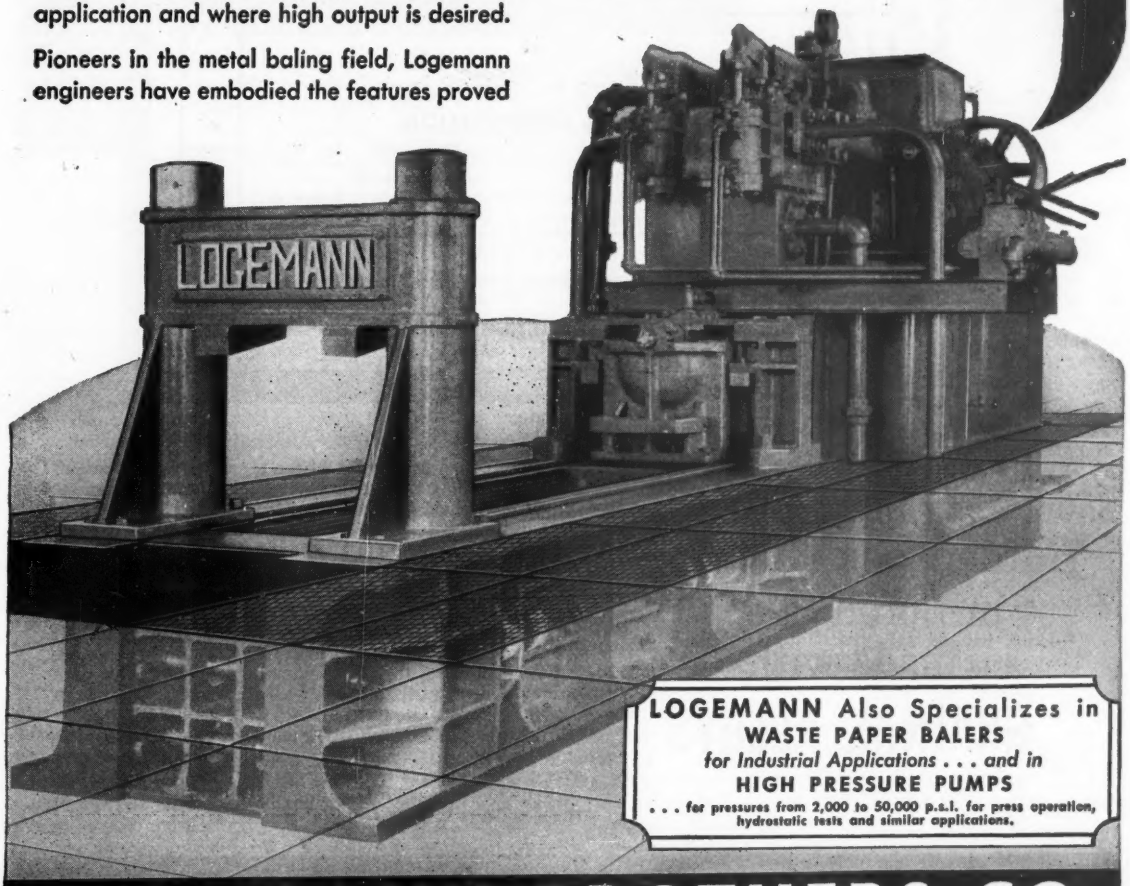
LOGEMANN Scrap Presses

Press, Pump, Tank... All in One Compact Assembly

Where space is limited, plants and mills can conserve floor space and piping, and at the same time handle high tonnages at low operating cost with a Logemann Scrap Press.

Both two and three ram models are available with automatic controls and are recommended when the nature of the scrap warrants such application and where high output is desired.

Pioneers in the metal baling field, Logemann engineers have embodied the features proved through actual operation to be essential to constant, uninterrupted service. Logemann engineers are prepared to offer suggestions as to operating layout and installation of any unusual or specific need. Present your problem to them, stating the nature of your scrap and the tonnage desired. There is no obligation.



LOGEMANN Also Specializes in
WASTE PAPER BALERS
for Industrial Applications . . . and in
HIGH PRESSURE PUMPS
. . . for pressures from 2,000 to 50,000 p.s.i. for press operation, hydrostatic tests and similar applications.

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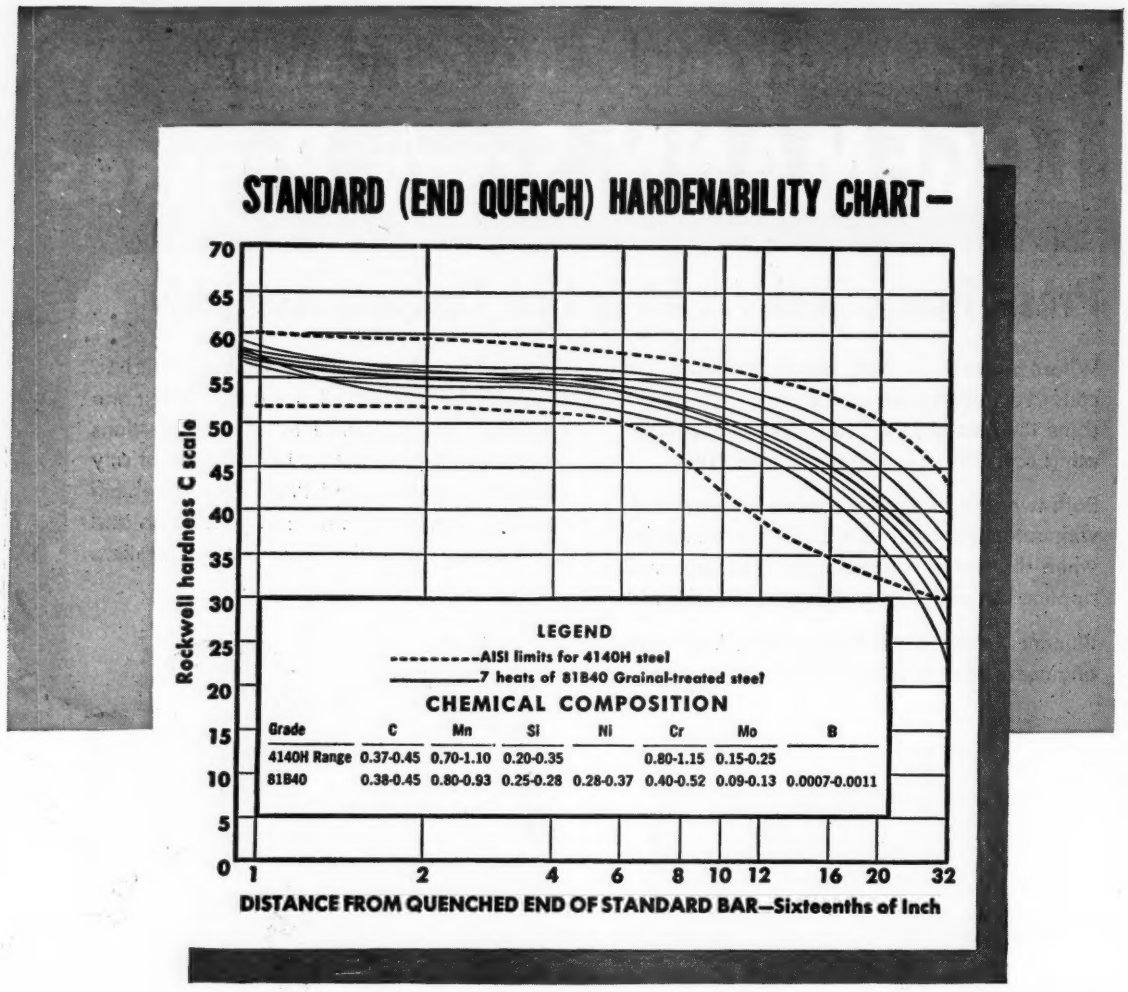


Consistent Hardenability obtained in Boron Steels made with GRAINAL ALLOYS

The most common test for boron steels is measurement of hardenability by the end quench or Jominy hardenability test. Today's steel substitutions are made on the basis of similar hardenability since a reasonable prediction can thus be made of the hardness and strength of a given part.

The curves above show the relationship between the hardenability of a series of seven heats of 81B40 steel and the hardenability band for 4140H steel, which it often replaces. The 81B40 heats were made in one electric furnace shop, and the remarkably consistent hardenability shown by the curves was obtained by the use of Grainal alloy as the means of adding the boron.

Consistent hardenability means consistent strength and hardness after heat treatment, which is the aim of every fabricator. The best proof that the Grainal alloys insure this objective is found in the successful use of three million tons of Grainal-treated steels.

VANADIUM CORPORATION OF AMERICA

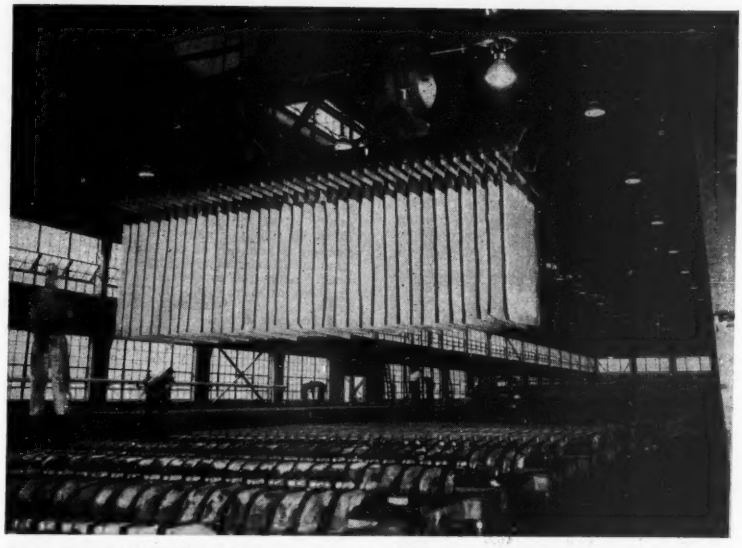
420 LEXINGTON AVENUE, NEW YORK 17, N. Y. • DETROIT • CHICAGO • CLEVELAND • PITTSBURGH

MAKERS OF ALLOYS

VANCORAM

CHEMICALS AND METALS

The Metal Market



Operations at Kennecott Copper Corp.'s Garfield, Utah, refinery were threatened last week by a 5-day wildcat strike (ended May 1) at American Smelting & Refining Co.'s Garfield smelter. Ore comes from Kennecott's Utah mines—largest in the U. S. Photo shows 300-pound cathodes lifted from washing tanks prior to entering electric furnace for melting and casting into marketable shapes

Return of competition to metal market is symbolized by first price cuts in nearly two years. Both buyers and sellers are watching civilian business barometers closely these days

ECONOMIC INDICATORS are getting closer scrutiny from men who buy and sell metals than at any time since 1949.

They're conscious of the fact that good defense business can make up for lagging civilian business only to a point. To make business good even with government orders, there must be a minimum civilian demand level for the goods made of metal.

Watchword—"Back to normal" is a phrase heard more frequently these days. Most people agree it's a healthier condition than that of the hectic past year. Those who've expanded because of predicted shortages and envision metal coming out their ears are preparing for stronger selling effort.

Return of competition can be symbolized by the consumer buying attitude for lead and antimony—as well as signs of contentment over availability of other metals. Price softening in lead and antimony won't be the last. Some other nonferrous metals are sure to follow; time and extent of the price slides depend on defense uses and the business level.

Stimulating—Consumers have been sweating out the lead-antimony price cuts for several months, as is shown by the level of fabricators' stocks. That low level plus the new price should stimulate sales, producers hope.

Lead is now priced at 18.00c a pound, New York, and 17.80c St. Louis. This marks the first decline in the price of metal since June, 1950. Lead pipe and full sheets now bring 23.00c. Traps and bends sell for list price plus 55 per cent, instead of 65 per cent previously. Antimony price was cut 6c to 44c a pound.

Marked Easing — Availability of metals was reported on favorably last week by both the International Materials Conference and Defense Production Administration. DPA finds "marked easing" since March in supply of practically all materials. "Most critical" label has been applied to titanium, cryolite and beryl ore. Galvanizing zinc moved down a notch into "approximate balance" category. High and special grades of zinc, antimony and lead slid from that group into "fair to good" supply.

IMC expects to drop distribution plans for zinc this year. It reports manganese ore in easier supply too. Copper and cobalt will be in short supply through 1952, nickel in critical supply. Tungsten and molybdenum are likely to be tight longer.

Inco Mines at Record Rate

Free world output of nickel will approximate 375 million pounds annually when current expansion programs are completed, International Nickel Co. of Canada, Ltd., president J. F. Thompson told stockholders in Toronto last week. Inco is now mining ore at a rate over 1 million tons a month and producing 21 million pounds of nickel a month.

Reynolds Power Terms O.K.'d

Agreement has finally been reached between Reynolds Metals Co. and the Interior Department over Reynolds' $35 million aluminum plant slated to be built in Arkadelphia, Ark. Controversy over power rates from government-owned hydroelectric projects has held up construction for several months. When completed the plant will turn out 60,000 tons of aluminum yearly.

Tin Cans for Copper Recovery

A tin can drive may be started in San Francisco to supply Arizona copper mines and the big Anaconda project now underway at Yerington, Nev. Robert Warner, chief of DPA's salvage operations, said in San Francisco the Nevada mine will require 4000 tons of cans a month to recover copper through a precipitation process. The cans are shredded and water from the mines is pumped over them to recover copper leached from the ores that otherwise would be wasted.

STEEL'S Metal Price Averages for April, 1952

(Cents per pound)

Electrolytic Copper, del. Conn.	24.500
Lead, St. Louis	18.723
Prime Western Zinc, E. St. Louis	19.500
Straits Tin, New York	121.50
Primary Aluminum Ingots, del.	19.000
Antimony, f.o.b. Laredo, Tex.	49.077
Nickel, f.o.b. refinery	56.500
Silver, New York	88.000

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c, 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 19.50c; brass special 19.75c; intermediate 20.00c, East St. Louis; high grade 20.85c, delivered.

Lead: Common 17.80c; chemical 17.90c; corroding 17.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 44.00c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 44.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $200-$204 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 88.00c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18%, 53.14; phosphor-bronze grade A, 5%, 61.07.

Rod: Copper, hot-rolled 37.53, cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze 95%, 41.30; 90% 40.82; red brass 85%, 39.83; 80%, 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29; commercial bronze, 90%, 43.79; red brass, 85%, 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95%, 41.90; 90%, 41.42; red brass, 85%, 40.43; 80%, 39.96; best quality brass, 39.44.

(Base prices, effective Dec. 26, 1951)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 28.545; 30,000 lb lots, 28.67; l.c.l., 29.17. Weatherproof, 100,000 lb, 30.35; 30,000 lb, 30.60; l.c.l., 31.10. Magnet wire del., 15,000 lb or more, 34.50; l.c.l., 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, Sheet In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Round— R317-T4 178-T4	Hexagonal— R-317-T4	178-T4
0.125	52.0	...	...
0.156-0.0188	44.0	...	...
0.219-0.313	41.5	...	...
0.375	40.0	46.0	48.0
0.406	40.0	...	...
0.438	40.0	46.0	48.0
0.469	40.0	...	...
0.500	40.0	46.0	48.0
0.531	40.0	...	...
0.563	40.00	...	45.0
0.594	40.0	...	...
0.625	40.0	43.5	45.0
0.688	40.0	...	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	...	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	...	...
1.625	36.5	...	39.5
1.688-2.000	36.5	...	...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $23.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils$23.00 per cwt. Traps and bends: List prices plus 55%.

ZINC

Sheets 26.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 25.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 25.50c-26.50c; over 12-in., 25.50-26.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, 6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 28.00c; 5 tons and over 28.50c; 1 to 5 tons, 29.00c; less than 1 ton 29.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb. 75.50c; 3000 to 10,000 lb. 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.375; 500 to 999 lb, $1.38; 200 to 499 lb, $1.385; less than 200 lb, $1.40. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Sannnous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Unsweated zinc dross, 13.75c; new clippings and trimmings, 15.50c; engravers' and lithographers' plates, 15.50c; die cast slabs, min. 90% zinc, 13.75c; old zinc scrap, 12.25c; forming and stamping dies, 12.25c; new die cast scrap, 11.75c; old zinc die cast radiator grille, 11.50c; old die cast scrap, 10.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 19.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb, or a flat price of 11.25c a pound of battery plates. Used storage batteries (in boxes) drained of liquid, 7.65c for 15,000 lb or more; 7.45c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 17.25c in lots of 20,000 lb or more; 16.50c in lots under 20,000 lb.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
May 1	24.50	17.80	19.50	121.50	19.00	44.00	56.50	88.00
Apr. 29-30	24.50	17.80	19.50	121.50	19.00	44.00	56.50	88.00
Apr. 26-29	24.50	18.80	19.50	121.50	19.00	44.00	56.50	88.00
Apr. 1-26	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Apr. Avg.	24.50	18.723	19.50	121.50	19.00	49.077	56.50	88.00
Mar. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Feb. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Jan. Avg.	24.50	18.80	19.50	109.404	19.00	50.00	56.50	88.00
1951								
Dec. Avg.	24.50	18.80	19.50	103.00	19.60	50.00	56.50	88.00
Nov. Avg.	24.50	18.80	19.50	103.00	19.00	44.56	56.50	88.00
Oct. Avg.	24.50	18.726	19.426	103.00	19.00	42.00	56.50	88.12

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Sheets, Strip . . .

Sheet and Strip Prices, Page 181 & 182

Washington — National Production Authority is removing second-quality carbon steel from the controlled materials list for fourth quarter. "B" products manufacturers are not to include seconds and rejects in their statements of requirements on the new CMP 4-B forms.

Second quality steel is defined as rejected or carbon steel shearing or second-quality steel usually sold at prices lower than those on prime quality materials, provided ingots, blooms, slabs, billets, sheet bars, wire rods and other semifinished forms and shapes shall not be deemed second quality.

Removal of seconds from controls frees about 800,000 tons of steel quarterly. About 90 per cent comes from flat-rolled products, such as shearings from sheet and strip steel. Such are used largely in the manufacture of washers, toys and similar products.

The new CMP 4-B form requires that shipments against orders carrying a DO rating with the suffix 5-B must be reported separately. All applicants for controlled materials also are required to fill in section 6 of the form. Producers of selected aircraft B products also now must submit their 4-B applications to the Aircraft Production Resources Agency, Dayton, O. These products are identified in the new CMP Product Assignment Directory, dated May 1, 1952.

Boston—Consumers have inventories averaging close to 45 days although there are exceptions and some are unable to place all second quarter tickets with mill schedules full on cold-rolled for the period.

New York—Most sheet producers are booked throughout third quarter on major grades, barring certain reserves for top military requirements. Demand for hot and cold sheets in particular is better than anticipated several weeks ago and comes in the face of a continued lag in end-use demand in some leading lines of consumer durable goods. There may be an element of scare buying in recent improvement, some sellers say, an element due to the possibility of disruptions in production from strikes. Also the bigger production directive provided the automotive industry appears to be a very definite contributing factor. One large automotive interest was set to re-sell more than 50,000 tons of sheets to Great Britain, but withdrew from negotiations when the bigger production directive was announced by Washington. Demand for some specialties continues to lag with low silicon sheets still available for delivery in June and July. Straight chrome sheets and strip can also be had for shipment around that time.

Philadelphia — Any loose ends in sheet supply were promptly tied up by the steel strike which affected most leading producers. The disruption in operations comes at a time when specifications are becoming more active, although still not as pressing as they are in other major products.

Cleveland—Sheet mills in this area are under pressure for additional tonnages of cold-rolled sheets for second quarter shipment. Within the past week inquiry on both defense and automotive account have been received, and in all cases the requests were turned away because of the booked up condition of the producers. Bookings through third quarter now are being received. Indications are volume will be sufficient to tax capacity through the period although demand from some directions is noticeably off from that some time back, especially from manufacturers of stoves, refrigerators and washing machines. These latter interests of late have been cutting manufacturing schedules. So far as can be learned no steelmaker is filing for price increases under the Capehart amendment, as authorized recently by Commerce Secretary Sawyer. Indications are no attempt will be made by the leading interests at least to avail themselves of the partial relief afforded until present uncertainties attending the wage-price debate are removed. Meanwhile, sheet consumers are watching the market carefully for signs of price easiness especially on those specialties that have not been moving well of late. To date, however, no price cutting at mill level is noted. In this connection, a report that Empire Steel Corp., Mansfield, O., had reduced its price on long terne sheets $11 per ton to 5.55c, f.o.b. Mansfield, was denied by the company last week.

St. Louis—Galvanized sheet producers are counting on a 40 per cent production increase by end of the year.

METALWORKING BRIEFS, a weekly feature of STEEL, takes on a new appearance and a new name this week—"Here and There in Metalworking." In it you will find news of what metalworking companies are doing; who is expanding, who is reorganizing, who is growing with America's biggest industry. This week Here and There in Metalworking starts on page 201.

CMP Procedure Liberalized

Washington — Liberalized self-authorization procedure under the Controlled Materials Plan which will permit certain manufacturers to obtain increased quantities of carbon and alloy steel, and aluminum, beginning third quarter, was announced last week by NPA.

Effective July 1, amendment to Dir. 1 to CMP Reg. 1 will permit small companies to share directly in the improved materials supply situation, and to extend the benefits of self-authorization to many small producers who formerly were unable to take advantage of this provision.

Producers who qualify under the amended direction will not be required to file CMP-4B applications for controlled materials.

Starting third quarter, manufacturers of Class B products will be permitted to use the self-authorization procedure of Dir. 1 to obtain controlled materials up to certain limits provided they do not exceed their average quarterly consumption of controlled materials during 1950.

Maximum self-authorization limits established under the amended direction are: Carbon steel, 60 tons; alloy steel (except stainless), 16 tons; stainless steel, 500 pounds; copper and copper base alloy brass mill products, copper wire mill products, copper and copper-base alloy foundry products and powder, 3000 pounds; aluminum, 4000 pounds.

The amended direction permits any manufacturer of Class B products to use up to the following quantities of controlled materials in third quarter, regardless of base period consumption: Carbon steel, 25 tons; alloy steel, except stainless, 1 ton; stainless steel, none; copper and copper base alloys, etc., 500 pounds; aluminum, 1000 pounds.

Where a manufacturer's needs exceed the prescribed limits for self-certification, he must apply for allotments of controlled materials on CMP-4B.

As a result of the liberalization of Dir. 1, manufacturers of certain types of Class A products are permitted for the first time to avail themselves of the self-authorization procedures. Included are manufacturers of Class A products who have been authorized to treat such products as Class B products and manufacturers of Class A products which are sold to distributors or for use as maintenance, repair and operating supplies.

Plates . . .

Plate Prices, Page 181

Philadelphia—Only two plate producers in this district were able to continue operations following the general steel strike call last midweek. These were Alan Wood Steel Co., Conshohocken, Pa., and Central Iron & Steel Co., Harrisburg, Pa., both of which signed agreements with the CIO steelworkers several weeks ago, terms to be based on such concessions as may be granted by the steel industry as a whole. The strike comes at a time when there is continued strong demand for heavy gage plate, such as required for pressure vessels, large boilers and condensers. Strip plate is in relatively easy supply, with one district producer having tonnage available for June.

Boston—Narrow light-gage plates are increasingly difficult to move, but wide and heavier material is in continued strong demand. Weldment shops are making no inroads on heavy order backlogs and could use more heavy plates, although the Z-2 order is helping them with respect to supply. Hot-topped quality plate demand exceeds capacity. Normalizing also is a bottleneck.

New York—Consumers of sheared plates are taking up virtually all tonnage offered for third quarter. They are fighting shy only of such tonnage as is being offered at exceptionally high premiums; also they are not showing any special interest in covering on strip plate for the more extended positions. Not all sheared plate producers have yet opened their books for the entire third quarter, some going on a month-to-month basis. Heavy gage plate remains in outstanding demand.

Steel Bars . . .

Bar Prices, Page 181

Washington—To assure deliveries of shell and fuse quality steel sufficient to meet military ammunition and other requirements, producers of hot rolled carbon steel bars and semi-finished steel will be required, by individual production directives in July and succeeding months, to set aside specified tonnages, NPA told the Industry Advisory Committee last week.

It was indicated that the third quarter requirement for steel of this quality is likely to be not less than that of second quarter.

The committee also was informed that the size of hot-rolled bars, together with the tonnages directed to be set aside for this program will be included in future production directive descriptions.

Government officials stressed the vital importance of maintaining a high level of production for the military requirements. It was pointed out that the NPA Iron & Steel Division has recommended adding two 14-in. bar mills to the current steel expansion program, with other facilities essential to their operation where necessary.

NPA representatives said the projectile body steel program has been progressing well in the past few months, and indications are that the situation respecting these steels will continue to improve.

The cold extrusion method of manufacturing shells was discussed at the meeting. While the process requires less machining, the steel must be rolled on a finished bar mill, causing committee members to believe its use might retard production of other military requirements.

Boston—Forge shops are allotted tickets calling for large tonnages of carbon bars and they are placing all authorized volume with the mills booked deep into third quarter. An increasing number of military contracts require bar tonnage, carbon and alloy. Only easing noted is in small rounds, one half-inch and under. One midwest producer opened with substantial tonnage in this category, slackening demand on converters. Practically all tonnage available in flats, all sizes, is being taken.

New York—Continued heavy demand for shell steel, combined with stepping up in requirements for the automotive industry, is contributing to further stringency in carbon steel bars. At the same time there is no let up in specifications from cold-finishers and bolt and nut manufacturers, among other larger consumers. Warehouses would quickly accept more than their quotas were producers in position to offer more. Practically all the larger producers have opened books for the entire third quarter and are turning away tonnage.

Philadelphia—The steel strike has placed a further squeeze on the most stringent of all major products, hot carbon bars. It closed the last possible chance for buyers in the market on a first-come-first-served basis to obtain tonnage for July. These buyers were permitted under government regulations to at least make a try for tonnage during the 15-day period beginning May 2. Delivery promises on alloy bars which were for August and beyond will be further advanced by the strike interruption.

Cleveland—No early easing in demand pressure on the bar mills is seen. Virtually no openings have appeared so far in second quarter schedules and most sellers report they are practically booked full for third quarter. Not only are requirements on defense account still rising, especially for the large sizes, but new volume is developing from the automotive interests. Forge shops still need tonnage though their supply position is improved as compared with a month or two back. Some tonnage was lost as result of the interruption of production attending the recent labor trouble, and this will add to the carryover from second to third quarter. Indications are it will be well into summer before sellers are able to catch up on backed-up orders.

Los Angeles — Cold-drawers are booked solidly through third quarter. Demand for small size cold-finished bars has eased but pressure for sizes over 2-in. remains strong.

Tubular Goods . . .

Tubular Goods Prices, Page 185

Cleveland—Just before the steelworkers' strike it appeared there would have to be active selling of buttweld steel pipe, both black and galvanized, by the end of the year. Demand for the smaller sizes was showing signs of weakening. However, demand for the larger sizes, such as are used in industry, was still strong.

Best supplies of buttweld pipe in warehouses were the smaller sizes. Industrial jobbers, who carry the larger sizes used by industry, had not been able to build up inventories.

Galvanized pipe is in improved supply, now that allotments of zinc have been increased by the government.

Demand for big line pipe continues strong and conceivably would remain heavy even in the event of a recession. All of the demands for natural gas have not been satisfied, and a recession might further inspire homes and industry to avail themselves of the price advantages of gas as a fuel.

Pipe nipples are in good supply, and some producers of them are passing up some of their mill allotments of pipe. Sale of pipe nipples is now highly competitive and some sellers are reported to be cutting prices.

Boston—Buttweld steel pipe is easing. Jobber stocks are building up and some are not taking full allotments for July. There is also a softening of prices in secondary sales with some tonnage offered 10 per cent and even 15 per cent off. An air conditioning company is offering 500 tons, three-quarter-inch buttweld from inventory. Light wall electric tubing is easy some tubing consumers offering surplus tonnage from their own small mills. At the other end of the pipe line, seamless is sold up into third quarter with some producers on direct shipments. Tubing specialties are also well booked ahead, but slightly more tonnage is offered in pipe-size pressure tubing. Among larger consumers of tubular products in this area, textile mill equipment builders are buying sparingly.

St. Louis—Pressure on galvanized pipe is increasing as the building season gets under way. Local production, which was cut back 50 per cent during the worst zinc scarcity, is approaching normal again. Order books for July will be opened about May 15. Demand for black pipe remains steady.

Seattle—Cast iron pipe demand is active, much of it coming from public works projects, the government furnishing materials.

Structural Shapes . . .

Structural Shape Prices, Page 181

New York—March structural bookings of 222,624 tons were off slightly from February and down 25 per cent from the like month of last year when 297,517 tons were reported, according to the American Institute of Steel Construction. Bookings first three months this year amounted to 666,566 tons, decrease of 27 per cent from the like period of 1951, but up 24 per cent over the same period during the average four years, 1947-1950, when 535,549 tons were booked. January and February bookings were revised to 213,110 and 230,832 tons, respectively.

March shipments amounted to 271,085 tons, an increase of 10 per cent over February. First quarter shipments totaled 762,430 tons, greater by some 18 per cent than the corresponding period last year. January and February shipments have been revised to 244,947 and 246,398 tons, respectively.

Inquiry locally is showing some improvement, although awards are scattered.

Boston—Inquiries for small lots are more numerous, but total tonnage being estimated is lower with the bulk of active bridge requirements bid. Distribution of elevated expressway contracts, Boston, 25,000 tons, is pending with Bethlehem Steel Co., Bethlehem, Pa. slated to fabricate a large share of this volume. Firm bids by some eastern shops indicate covering on an estimated steel price increase of about $6 per ton. In New England, competition is clouding this trend and original structural estimates are frequently shaded.

Philadelphia—Structural steel activity here continues to lag with inquiry spotty and few awards involving 100 tons or more. Bridge work is about the only line in which demand is fairly sustained.

Washington—Removal of structural steel controls at earliest time consistent with safety of the defense program was recommended by the Structural Steel Fabricators Industry Advisory Committee meeting with the National Production Authority. Removal of CMP control is held warranted by the improved supply-demand situation.

The committee urged NPA amend its regulations to provide for automatic revalidation of controlled materials allotment tickets which cannot be cashed in a given quarter. Extension of the inventory limitation from the present 45 days to 120 or 145 days has been urged for some time, and NPA now says individual requests for such extension will be granted.

Efforts will be made by the government to provide more structurals for commercial construction in fourth

quarter. Meanwhile, approximately 1,400,000 tons of structural steel are being produced quarterly, 900,000 tons going into construction, the remainder into production.

Birmingham—Memphis plant of U. S. Steel Co.'s American Bridge Division booked a contract for 3000 tons of fabricated steel for a carpet factory to be built at Greenville, Miss., for the Greenville Mills, Inc., subsidiary of Alexander Smith, Inc., Yonkers, N. Y.

Seattle—Local fabricators are actively seeking business for last half of year. Considerable tonnage is pending, including 3000 tons for Boeing's Seattle hangar, award to American Bridge Division, U. S. Steel Co. having been delayed by site purchase negotiations. The week's awards include 5000 tons for two Washington state bridges. In addition to large subawards pending for Northwest power projects, Boeing will receive bids May 5 for a shop structure, involving 1500 tons. Plants report continued difficulty in obtaining steel.

Wire . . .

Wire Prices, Page 183

Boston — Wire users continue to cut back orders in making inventory adjustments, buying sparingly on the basis of estimated needs during the next three-four months. Result is a lag in third quarter orders and numerous revisions in second quarter schedules. This applies to rods as well as finished wire. Spring winding activity is off and is highly competitive. Screw backlogs are down and some cold heading tonnage for second quarter has been turned back to the mills. Pressure for alloys is mild, including boron. Signs of improvement in automotive demand are not accompanied by urgent delivery pressure.

Chicago—The easing in supply of many wire products has been accelerating. One evidence of this comes from mechanical spring manufacturers who report they have been receiving from the mills in April wire shipments scheduled for May.

Pig Iron . . .

Pig Iron Prices, Page 180

Chicago—Most gray iron foundries have sufficient pig iron inventories to last out interrupted shipments for two weeks to a month. However, because of the uncertainty which the sudden strike has imposed on future iron supply castings makers undoubtedly will choose to stretch stocks by increasing the scrap ratio in their melts. Of the 40 blast furnaces operating when the strike came, all have been idled except the three of Wisconsin Steel Co.

Boston—Demand and consumption of pig iron is off, both basic and foundry grades. Limited shipments of basic are coming from Troy, N. Y., all-rail to one steelworks. Foundries are operating largely on inventories and with the melt of some shops down, pressure for tonnage from New York and outside furnaces is not strong.

New York—With most district gray iron foundries operating at no more than 60 per cent of capacity, pig iron demand is only moderate. The recent increases in inventory limitations have resulted in somewhat more volume in certain instances, but in no case is there any particular pressure. Meanwhile, demand for foreign iron has virtually ceased, with little coming in even against old contracts. An exception is limited tonnages of charcoal iron and other specialties. Actually, there is some feeling around, by England in particular, for iron for shipment from the United States, although no sales have been reported. Foundry coke continues in ample supply.

Buffalo—All blast furnaces in the area were idled by the strike last midweek. Operations for the week averaged 32 per cent of capacity.

Philadelphia — Three district blast furnaces have been able to continue operations without being forced down by the strike. These are the two stacks at Swedeland, Pa., and the one at Chester, Pa., both operated by companies which have previously made tentative agreements with the steelworkers' union. The disruption to operations at most furnaces comes when supply and demand for foundry pig iron are in better balance than at any time in months.

Cleveland—Foundry pig iron inventories vary but most shops in the area have sufficient stocks to maintain operations at current levels for several weeks. Expectations are that more scrap will be used in melts in an effort to stretch iron supplies as far as possible. The melt at many foundries has been curtailed for some time due to slow castings demand from civilian goods makers. Demand pressure on merchant iron sellers has been relaxing gradually, though the furnaces have been able to dispose of all their output. All ten blast furnaces in this area are idle. Eight were banked when the strike was called last midweek. Two had been out for relining and general repairs.

Youngstown — Twenty-three of 25 blast furnaces in this immediate district were in blast prior to the strike. Two stacks were down for relining, one at Ohio Works of United states Steel Co., and the second at the Warren plant of Republic Steel Corp.

St. Louis—For the first time in two months most iron consumers in this area are in comfortable position. Production was cut in half for 60 days during furnace repairs and customers were put on short rations. Bridging the gap was aided by spotty demand of foundries. Farm equipment makers are seeking more iron.

Semifinished Steel . . .

Semifinished Prices, Page 181

Detroit—Shutdown of basic steelmaking operations in Detroit, with the exception of Ford Motor Co.'s mill, was orderly and crews were allowed to take precautionary measures to prevent damage to furnaces on Wednesday. Ford, under contract with the UAW, was unaffected by the strike. Ford's mill set another weekly record at its openhearth in the week ended Apr. 26, turning out 30,649 tons of ingots.

Youngstown — Steelmaking operations were unchanged here at 105 per cent of capacity prior to the strike. Seventy openhearths and three bessemers were on.

Scrap . . .

Scrap Prices, Page 188

Chicago—Steel mills closed by the strike promptly issued instructions to brokers and suppliers to hold up shipments of scrap until further notice. Only exception is U. S. Steel Co. which, for the time being, will continue to take railroad and industrial material but bans that from dealer origin. It is presumed the material will remain in cars subject to demurrage charges. That in transit falls in the same category. If the strike lasts any length of time, cast scrap may undergo a reversal of the weakness suffered for many weeks. Cut off from normal pig iron supply gray iron foundries can be expected to stretch iron inventories through increased use of scrap.

Boston—One steel company held up all shipments before the work stoppage, due primarily to a decline in its operating rate. Pressure from other consumers is off, although there is a shortage of good No. 1 steel scrap. Cast scrap is moving slowly with prices soft.

New York—Failure of the Office of Price Stabilization to adopt a "commercial tolerance" amendment to CPR 5 was protested at a dinner meeting of the New York chapter of the Institute of Scrap Iron & Steel Inc. Proposal for such an amendment has been before OPS since May 12, 1951. Failure to make CPR 5 conform to normal trade custom, it is claimed, constitutes a serious impediment to collection, preparation and distribution of scrap. Fred Seligmann, president of the New York chapter, presided at the meeting. Benjamin Schwartz and Herman D. Moskowitz were the principal speakers.

Buffalo — Mills report sharp increases in reserve scrap stocks and cast prices continue to slide as weaker tendencies definitely prevail. With mill supplies up allocations are expected to be eliminated in the near future. Cast scrap has declined with new orders reported placed at $45 for No. 1 cupola, $4 under government ceiling. What effect the steel strike will have on the market is uncertain.

Philadelphia — Due to the strike, most leading consumers of steel scrap suspended shipments. The disruption found inventories at most mills better than a month or so ago, although not good by normal standards. Cupola cast shows further weakness, now holding at $44 to $45 delivered. Unstripped motor blocks are unchanged at $40 delivered, with too little business going to provide a thorough test of the market. Actual buying of this latter grade would likely develop lower prices, it is believed.

Cleveland—Sudden closing down of steelworks and blast furnaces by the strike dampened sentiment in the scrap market here last week. This largely was attributable to the prompt cutting off by the mills of dealer shipments. It was significant that the mills did not suspend shipments of railroad and industrial material. Where necessary, incoming shipments of these latter grades were held in cars or stored in dealers' yards. The policy of continuing to accept such shipments is seen as supporting view that quality steelmak-

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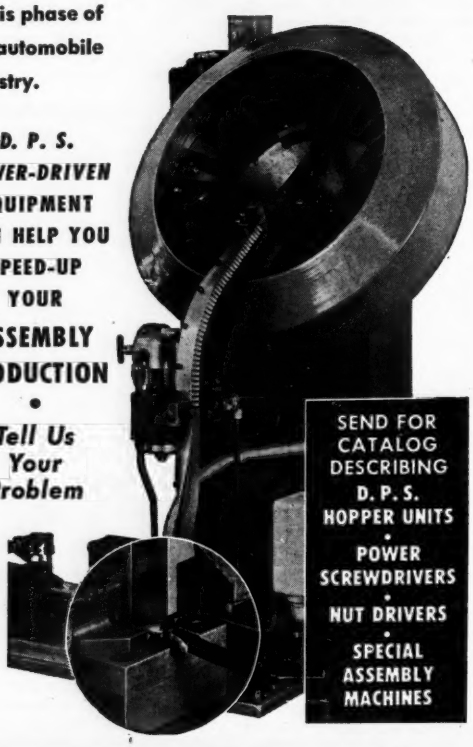

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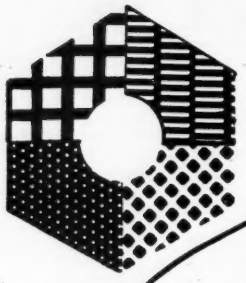

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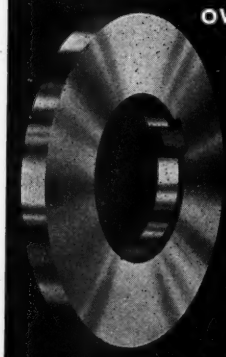

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ing scrap still is in short supply despite the improved inventory position of the mills. Should weakness develop in the market as the result of the strike it is believed it will first show up in the blast furnace grades, such as short shoveling turnings. Some trade authorities think the closing down of blast furnaces will redound to the benefit of cast scrap which has been weak pricewise because of slow foundry demand. They see greater use of cast scrap in foundry melts as pig iron inventories shrink, but last week there still was no sign of a firming up in the cast grades. Such material reportedly was being offered at delivered prices $5 under ceiling without finding takers. No. 1 cupola cast was said to be available around $44, and unstripped motor blocks at about $38.

Detroit—The strike caught steelmakers taking in scrap on a normal basis with no arrangements made to lay it down elsewhere. Rerouting directions were hurriedly issued. Foundry scrap failed to respond in noticeable degree to the shutoff in pig iron shipments.

St. Louis—Steel scrap market undertone continues to soften, but is manifest less in price quotations than in cautious placing of orders. Mills are in comfortable stockpile position, shipments to dealers are due for seasonal improvement, quality of scrap is rising, freight rates are undergoing change—all of which factors deters consumers from hasty commitments. Brokers are bargaining more and more with freight absorption. Rail rerollers anticipate offerings will be exceptionally good this summer, although they are light now, due to replacement programs railroads have scheduled. New rail shipments are improving slightly already and weather is permitting start of roadbed work.

San Francisco—It is predicted that before long No. 2 bundles will be selling $5 per ton below ceiling prices. Most mills are only in the market in a limited way for this grade of scrap. Mills also are entirely out of the market for cast grades. Some small sales to foundries have been made of No. 1 cupola cast with the price understood to be $42 a ton.

Seattle—Steel scrap supplies are increasing. The situation looks satisfactory to mill buyers who are restricting purchases to nearby areas, saving high freight from distant points The largest mill buyer here is out of the market for bundles and cast iron. Railroad car figures show a sharp drop in the movement of scrap.

Ferroalloys . . .

Ferroalloy Prices, Page 187

New York—Climax Molybdenum Co. made effective Apr. 24, a price of $1.41 f.o.b. Langeloth, Pa., per pound Mo. contained on powdered ferromolybdenum. The former price was $1.32. Change was pursuant to Office of Price Stabilization order No. L-938, dated Apr. 17. Commenting on the change, the company says it was forced to request this nominal increase in price in order at least partially to defray expenses involved in crushing most of its powder production. In the past the company has been able to supply powder consumers with a product which was merely strained from larger sizes of ferromolybdenum production. This change is a result of a substantial relative increase in powdered ferro-consumption.

Warehouse . . .

Warehouse Prices, Page 187

Washington — Immediate embargo on shipments of steel to exporters and manufacturers of consumer durable goods to preserve supplies for defense production was ordered last week by the NPA promptly upon calling of the steel strike at midweek.

The freeze applies to all steel products in warehouses and mills, except mills which continue to operate. Under direction 11 to CMP Reg. 1, which embodies action recently taken in Directions 10 and 10-A to CMP Reg. 1, no one may ship or accept delivery of steel controlled materials for export or for production of civilian type items.

An exception was made for steel actually in transit to users when the strike was called.

Specifically, Direction 11 provides that, from the effective date until a date to be stated in an amendment or by revocation of the order, no person shall accept delivery of steel in the forms and shapes indicated in schedule 1 to CMP Reg. 1, from any source other than a controlled material producer, except steel which was in transit on the effective date of the order, if such steel was (a) ordered pursuant to an authorized controlled material order bearing the program identification V followed by a digit, or (b) is to be used in the manufacture of products pursuant to authorized production schedules bearing the program identification V followed by a digit, or (c) was ordered for export, or is to be exported, outside the United States.

No person is permitted to make shipment of such steel, if he knows, or has reason to believe, that its acceptance will constitute a violation of the provisions of the regulation. The symbol V followed by a numeral, identifies materials used in the production of consumer durable goods.

Cleveland—Freezing of warehouse stocks will prevent raids on distributors' supplies by automobile builders and large manufacturers of civilian durable goods whose mill shipments are cut off by the steel strike. Needs of small customers can continue to be filled to the extent stocks permit. At the moment, inventories of sheets and light plates are described as comfortable but stocks are limited in bars, heavy plates and structurals. As a general thing, warehouse stocks are estimated about 40 per cent below what they should be. Also, they are unbalanced though overall tonnage is up noticeably since last October, having risen at a rate of 5 to 10 per cent monthly until the early-April steel labor trouble checked the uptrend. Some distributors figure their mill receipts are off 15 to 25 per cent since the early-April steel production interruption. Distributors here report no buying rush immediately in evidence as result of the

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steel walkout, but they expect to be swamped with requests if the strike is prolonged and buyers increasingly are forced to shop around for their needs.

Detroit—Order clamping down on civilian shipments from warehouses had not reached the distributors by Wednesday and except for those interests which are directly tied to steel producers business went on as usual. Warehouses with mill affiliations generally were struck the first day. One major interest has an AFL contract and was unaffected. Few warehouses expect their stocks to last long if the steel strike is prolonged.

Chicago—Suddenness of the steel strike produced a flurry of orders upon warehouses. The surge in business was not hysterical but it was obvious that consumers holding ratings and not subject to the civilian embargo restrictions were feeling concern over their steel needs. Plant of U. S. Steel Supply Division, U. S. Steel Co., is closed by the strike.

Rails, Cars . . .

Track Material Prices, Page 183

New York—The Delaware & Hudson railroad has approval from the New York State Public Service Commission to purchase $15,800,000 worth of equipment. The program includes 65 diesel-electric switching engines, 500 twin-hopper freight cars and 500 box cars. Purchases will be made from Bethlehem Steel Co., American Locomotive Co., Pullman-Standard Mfg. Co.

Birmingham — Pullman Standard Car Co. has been awarded 400 fifty-ton all-steel hopper cars by the Nashville, Chattanooga & St. Louis railway at a cost of $5130 each. The board also authorized purchase of three diesel locomotives and miscellaneous equipment.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 185

Youngstown—New byproducts coke facilities at Republic Steel Corp.'s Youngstown district plant had been placed in operation prior to the strike, replacing old ovens that will be dismantled. The new facilities are part of a $20 million modernization program. Included are two new coke batteries. One battery built in 1937 remains.

Iron Ore . . .

Iron Ore Prices, Page 187

Cleveland—Ore movement on the Great Lakes is gaining momentum steadily. Latest week's shipments, amounting to 2,421,053 gross tons, compared with loading of 2,355,697 tons in the like week of 1951, according to the Lake Superior Iron Ore Association. Cumulative shipments in the 1952 season so far now stand at 5,575,459 gross tons, comparing with 5,255,637 in the corresponding period last year.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4500 tons, 4-lane Pasco-Kennewick Columbia river bridge, Washington state, to American Bridge Division, U. S. Steel Co., Portland, Oreg., low $3,073,376.

3600 tons, two maintenance hangars, Lockbourne Air Field base, near Columbus, O., to R. C. Mahon Co., Detroit, $2,074,208.

925 tons, Army warehouse, New Cumberland, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

715 tons, laboratory building, San Francisco naval shipyard, to Bethlehem Pacific Coast Steel Corp., San Francisco.

680 tons, bridge work, thruway, Madison county, New York, to Ernst Iron Works, Buffalo, through Savin Construction Co., Hartford, Conn., general contractor.

540 tons, Mohawk section, state thruway, Amsterdam, N. Y., to Phoenix Bridge Co., Phoenixville, Pa., throught Lane Construction Co., Meriden, Conn.

500 tons, 358 trash rack sections, McNary dam, to Valley Iron Works, Yakima, Wash., low to U. S. Engineer, $528,464.

425 tons, Washington state Ebey Slough bridge, to Poole, McGonigle & Dock, Portland, Oreg.; general contract to Guy F. Atkinson Co., Seattle, low $1,192,822.

200 tons, state bridge, Wenham-Manchester, Mass., to West End Iron Works, Cambridge, Mass., general contractor.

150 tons, state highway bridge, Fall River expressway, Raynham, Mass., to West End Iron Works, Cambridge, Mass.; J. F. Fitzgerald Construction Co., Boston, general contractor.

STRUCTURAL STEEL PENDING

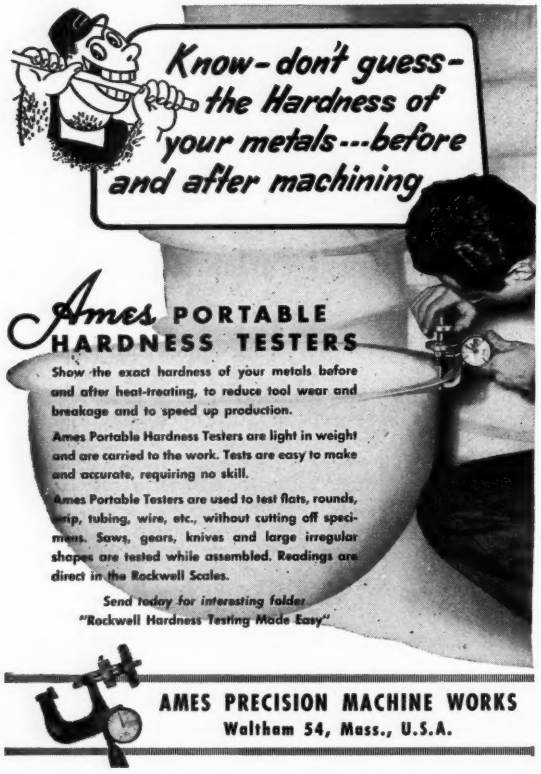
5400 tons, Palisades dam, Idaho; general contract awarded.

1800 tons, maintenance hangar, Holloman Air Field base; bids to Corps of Engineers, Albuquerque, N. Mex.

1500 tons, Boeing Airplane Co., Seattle, shop building, bids in May 5.

1000 tons, 350-bed, 14-story, $6 million University of Oregon hospital; bids to Oregon Board of Higher Education, Portland, Oreg., about June 17.

755 tons, state bridge, Lehigh county, Pennsylvania; Shaller Hoffmesiter, East Greenville, Pa., low on general contract.



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500 tons, trash racks, stop logs, weirs, etc., also machinery; McNary dam; bids to U. S. Engineer, Walla Walla, Wash., June 3.

500 tons, Oregon state highway bridge, Hood river; general contract to General Construction Co., Portland, Oreg., low $121,162.

360 tons, building No. 44, Frankford arsenal, Philadelphia, bids May 8.

250 tons, stop logs, lifting beams for Big Cliff dam; W. H. Reiler Co., Boise, Idaho, low $73,325 to U. S. Engineer.

REINFORCING BARS . . .

REINFORCING BARS PLACED

3285 tons, Navy Purchasing Office, Washington, to United States Steel Co., Pittsburgh.

1000 tons, Washington state Ebey Slough bridge, to Northwest Steel Rolling Mills, Inc., Seattle; Guy F. Atkinson Co., Seattle, general award.

805 tons, Navy Purchasing Office, Washington, to Bethlehem Pacific Coast Steel Corp., San Francisco.

425 tons, Washington state Pasco bridge, to unstated Portland fabricator.

340 tons, including 75 tons structurals, laboratory and research center buildings, Dow Chemical Co., Freeport, Tex., to Alamo Iron Works, Houston, Tex., through Southwestern Construction Co., Houston, general contractor.

REINFORCING BARS PENDING

455 tons, Eklutna power plant, Alaska; bids May 20, Bureau of Reclamation, Denver.

325 tons, spillway, Jemez Canyon dam; bids in to Corps of Engineers, Albuquerque, N. Mex.

100 tons, Washington state highway projects; bids to Olympia, May 13.

100 tons, laterals and wasteways, Columbia Basin project; bids to Bureau of Reclamation, Ephrata, Wash., May 20.

PLATES . . .

PLATES PLACED

500 tons, Navy Purchasing Office, Washington, to Jones & Laughlin Steel Corp., Pittsburgh.

350 tons, floor plates, Navy Purchasing Office, Washington, to Alan Wood Steel Co., Conshohocken, Pa.

100 tons, elevated steel water tank, air field base, Moses Lake, Wash., to Chicago Bridge & Iron Co., Chicago.

100 tons, elevated steel water tank, air field base, Kansas City, Mo., to Darby Products & Steel Plate Corp., Kansas City, Mo.

PIPE . . .

CAST IRON PIPE PLACED

250 tons, system expansion Grants Pass, Oregon, to Pacific States Cast Iron Pipe Co., Provo, Utah.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Louisville & Nashville, 55 diesel-electric locomotive units, awarded as follows: sixteen 1000-horsepower yard switchers, twelve 1600-horsepower road switchers, seven 1600-horsepower "D" freight units and two 1600-horsepower "A" freight units, to the American Locomotive-General Electric Companies, Schenectady, N. Y.; and fifteen 1500-horsepower general purpose units and three 1200-horsepower yard switchers to the Electro Motive Division, General Motors Corp., La Grange, Ill.

Nashville, Chattanooga & St. Louis, three diesel-electric locomotives, to Electro Motive Division, General Motors Corp., La Grange, Ill.

Norfolk Southern, five 1600-horsepower diesel-electric freight locomotives, to the Baldwin-Lima-Hamilton Corp., Eddystone, Pa.

RAILROAD CARS PLACED

Chicago, Burlington & Quincy, ten stainless steel passenger cars, to Budd Co., Philadelphia.

Ontario Northland, three steel baggage cars, to the National Steel Car Corp., Hamilton, Ont.

RAILS PLACED

Central of New Jersey, 1165 tons to Bethlehem Steel Co., Bethlehem, Pa.

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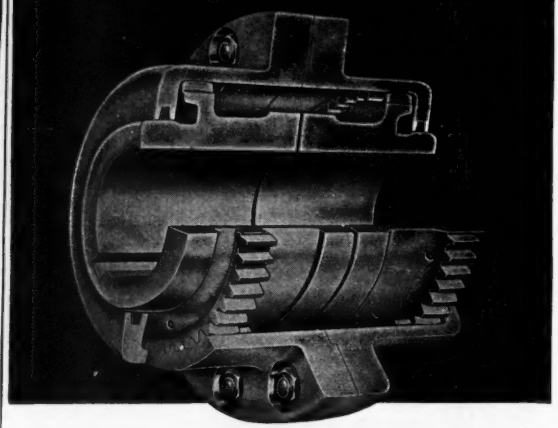

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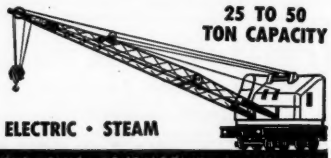

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Here and There in Metalworking . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Spring Fabricator Expands

Comfort Spring Corp., Baltimore, maker of bed and box springs, will start work shortly on erection of an addition to its plant at Hollins Ferry road and the Baltimore & Ohio Railroad. The addition is expected to be in operation within a year.

Bliss Transfers Sales Office

E. W. Bliss Co., Toledo, O., transferred its New Haven, Conn., district sales office to 7 Whitney Ave., that city.

Koppers Revises Operations

Koppers Co. Inc., Metal Products Division, Baltimore, is discontinuing production of automotive piston rings so as to concentrate on aircraft and industrial rings. The space thus released will be used to expand other company operations. The company is expanding its machine shop.

Appliance Firms Merge

Baltimore Porcelain Steel Corp., Baltimore, has merged with Artkraft Mfg. Corp., Lima, O., to form Universal Major Electric Appliances Inc. The Baltimore plant is beginning to manufacture a line of washing machines and electric ranges formerly made by Landers Frary & Clark, New Britain, Conn. Transfer of this operation to Baltimore necessitates construction of a plant addition. In addition to these lines, the Baltimore plant will continue to manufacture deep freezers, room coolers and porcelain bathroom and kitchen appliances.

Meehanite Licenses Foundry

Meehanite Metal Corp., New Rochelle, N. Y., entered into a contract to install the Meehanite casting manufacturing processes at the Franklin, Pa., foundry of Chicago Pneumatic Tool Co., Chicago. The company will manufacture Meehanite castings largely for use in its own line of products.

Hansand To Honor Thompson

Hansand Corp., Cleveland, announced that the C-4 vessel which is being converted into a bulk carrier for lake trade will be named the *Joseph H. Thompson*. Mr. Thompson is a vice president of M. A. Hanna Co. and president of Hanna Coal & Ore Corp., Cleveland. Hansand Corp. is owned jointly by Wheeling Steel Corp., Sand Products Corp., Detroit, and Hanna Coal & Ore Corp., which is an M. A. Hanna Co. subsidiary.

When converted the ship will be the largest one on the Great Lakes, with an overall length of 710 ft and beam of 71.5 ft. Work is currently being done by Maryland Drydock Co. and by Ingalls Ship Building Corp. and will be finished at American Ship Building Co.'s Chicago yard. The ship will be operated as a unit of the Hanna fleet.

Consolidated Builds Addition

An additional building has been completed by Consolidated Tube Corp., Mt. Vernon, N. Y. This doubles the firm's capacity for warehousing of steel tubing exclusively. The addition is mainly for storing stainless and alloy steel tubes.

Capitol to Build Foundry

Capitol Foundry Co., Phoenix, Ariz., acquired a large tract of property six miles southeast of that city and will build a large foundry there at a cost of more than $1.6 million. The firm was purchased recently by National Malleable & Steel Castings Co.,

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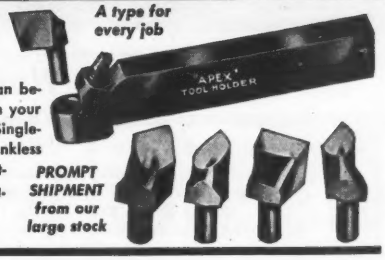

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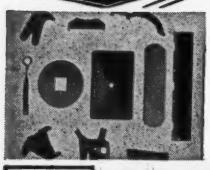

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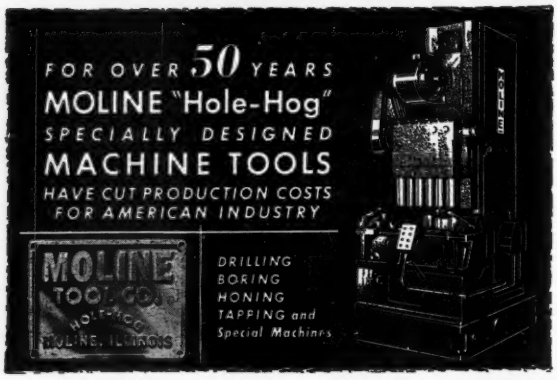

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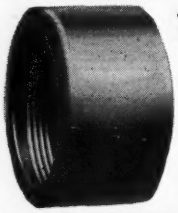

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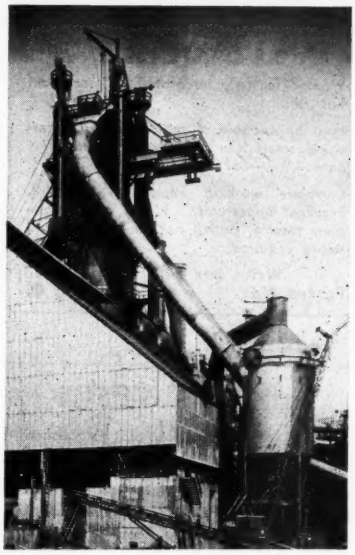

No. 6 Blasts Away

When C. M. White, Republic Steel Corp. president, lighted the new blast furnace No. 6, the nation's blast furnace capacity increased by 1470 tons a day. It is the first major facility to be completed in Republic's $75 million expansion plan to add 672,000 tons of steelmaking capacity in Cleveland

Cleveland. The new foundry will produce cast steel grinding balls for the mining industry and will have annual capacity of 25,000 tons. The new plant is expected to go into production within a year.

Capitol also is considering a $1.5 million castings plant on the same site to produce a general line of castings of various ferrous alloys for the mining industry. Engineering plans for this second unit are under way.

Welder Group Offers Prizes

Entries in Resistance Welder Manufacturers Association's prize paper contest must be received not later than July 31 at the association's headquarters, 1900 Arch St., Philadelphia. The contest is open to those in industry or engaged in research laboratory work; instructors, graduate students or research fellows in universities; undergraduate students.

Carboloy Plans Expansion

Construction of a 90,000 square foot permanent magnet manufacturing plant will get under way in Detroit soon for Carboloy Department, General Electric Co., Detroit. Estimated cost of the plant, including equipment, is $3.5 million. Construction is expected to be completed in the spring of 1953. The plant will be located adjacent to the

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Carboloy Department's $1.5 million standard carbide tool fabricating plant recently completed and now in full scale operation.

More Steep Rock Ore Found

Drilling during the past month increased by 50 per cent the length of the "G" ore body of Steep Rock Iron Mines Ltd., Steep Rock Lake, Ont. With exploration still to be completed, length of the indicated ore on the "G" zone already has been extended to 4500 feet, while the indicated width is 150 feet. Julian Cross, mining engineer, believes the Hogarth and Errington mines and the intervening "G" zone actually comprise one continuous ore body, almost three miles in length. Mr. Cross believes that "production from this single portion of the Steep Rock range can be maintained at 6 million tons annually for generations. When the entire range has been fully developed, output of double that tonnage can be expected, and this might, under certain circumstances, be expanded to as much as 15 million tons a year."

General Automatic Expands

General Automatic Products Corp., Baltimore, manufacturer of domestic heating equipment, will start work immediately on erection of the initial unit of a branch plant at its Dundalk location. The unit will be used for producing baseboard radiation. Claude W. Schafer is president.

Empire Moves Warehouse

Empire Steel Products Co. moved its offices and warehouse to 2120 E. Nine Mile Rd., Hazel Park, Mich.

Ellicott To Enlarge Shop

Ellicott Machine Corp., Baltimore, maker of hydraulic dredges and dredging machinery, grapple dredges, sand pumps, marine engines, etc., awarded a contract for an addition, containing about 10,000 square feet, to its machine shop. The department's floor space will be increased about 25 per cent. C. Ellis Ellicott Jr. is president.

Starrett Names Distributor

L. S. Starrett Co., Athol, Mass., appointed Republic Supply Co. of California as its only statewide distributor in that state for its entire line of machinists' tools, metal cutting saw blades, precision-ground flat stock and bar stock steel.

Ekco Makes Purchase Offer

Ekco Products Co., Chicago, offers to buy all of the stock of Republic Stamping & Enameling Co., Canton, O., producer of enameled housewares,

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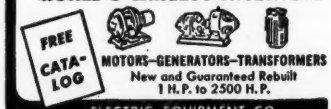

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Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, All-Steel, 70-Ton, Cross Dump
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No Controls

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Will sell all of above furnaces as is or make whatever minor repairs which may be necessary to put in new condition.

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'Family Portrait'; Smallest Are Oldest

Airliner growth from 1934 to date is shown in this line-up of six Lockheed Aircraft Corp. planes at Burbank, Calif. Passenger capacity increased from 12 to 180, speeds from 200 mph to 400 mph, total weights from 10,500 to 184,000 pounds. Useful loads today are 17 times greater while total engine power has increased 15 times. Small planes are Electra, Model 14 and Lodestar of the '30s

refrigerator storage units and other products. Ekco would continue production of Republic's present line of products. The large Republic plant would give Ekco needed space for production of new products now being planned. Acceptance of Ekco's offer by Republic stockholders is expected by May 19.

Iron Works Damaged by Fire

Fire swept the plant of Commercial Iron Works, Portland, Oreg., destroying much equipment and machinery. Future plans are unannounced.

Philadelphia Office Moved

Cincinnati Milling Machine Co., Cincinnati, moved its Philadelphia district sales office to 580 Lancaster Ave., Bryn Mawr, Pa. The new office, managed by Eberhardt Reiniger, provides ample room and facilities for the sales and service personnel of the machine tool staff, as well as the field men of Cincinnati Milling Products Division for that area.

Weather-Wise Opens New Plant

Weather-Wise Window Co. Inc., producer of aluminum windows, moved its operations from Alliance, O., to its new $250,000 plant in Youngstown. The firm plans to start manufacture of aluminum doors soon.

Packard-Bell To Expand

Packard-Bell Co. is planning construction of a $400,000 addition to its main plant at 12333 W. Olympic Blvd., Los Angeles, for manufacture of radios, television, phonographs and electronic equipment for the armed forces. Completion is scheduled by November.

Stewart Mfg. Opens Plant

F. W. Stewart Mfg. Corp., Chicago, opened its new Los Angeles plant at 1638 S. Flower St. This provides the company additional manufacturing space over its previous location at 431 Venice Blvd. The plant will be devoted entirely to the manufacture and fabrication of flexible shaft assemblies, flexible shafting and their components.

Republic Rubber Names Agent

Republic Rubber Division, Lee Rubber & Tire Corp., Youngstown, appointed John Bouchard & Sons Co., Nashville, Tenn., as its distributor in that territory. The new distributor will carry a representative stock of Republic's industrial rubber products.

Ship Supply Station Closed

Pittsburgh Steamship Division, United States Steel Co., is closing its marine supply station at Conneaut Harbor, O. Henceforth, the ships of its fleet will be supplied from the division's station at Sault Ste. Marie, Mich., when downbound. Clarence H. Smith, who has served as storekeeper for Pittsburgh Steamship at Conneaut since 1944, will remain in that city as agent for the division.

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☐ **Shaped Wire***

— Flat
● Round
◙ Odd contour

Low or high carbon, stainless, special alloy, Armco. You draw the shape—PAGE can draw the wire.

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Tinned stainless or carbon steel. In reels of 50 to 200 pounds. Stainless has high tensile strength, high resistance, low permeability.

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*Cross-sectional areas up to .250" square; widths to ½"; width-to-thickness ratio not exceeding 6 to 1.

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Advertising Index

Abbott Ball Co., The 199
Abrasive Products, Inc. 177
Accurate Perforating Co. 196
Aeroquip Corporation 120
Air Reduction 159
Ajax Electrothermic Corporation 55
Ajax Engineering Corp. 125
Allied Research Products, Inc. 139
Allis-Chalmers 38, 39
American Chain & Cable, Page Steel & Wire Division 207
American MonoRail Co., The 118
American Screw Co. 53
American Welding & Manufacturing Co., The. 96
American Wheelabrator & Equipment Corp. 132, 133
Ames Precision Machine Works 198
Anaconda Wire & Cable Co. 162
Apex Tool & Cutter Co., Inc. 201
Atlantic Screw Works, Inc. 53

Babcock & Wilcox Co., The, Tubular Products Division ..... Inside Front Cover
Barber-Colman Co. 174
Bay City Forge Co. 202
Bay State Abrasive Products Co. 122, 123
Behr-Manning Corporation, Division of Norton Co. 52
Belmont Iron Works, The 202
Bethlehem Steel Co. 1
Bixby, R. W., Inc. 204
Blake & Johnson Co., The 53
Blaw-Knox Co., Lewis Foundry & Machine Division 11
Bliss, E. W., Co. 16, 17
Brandt, Charles T., Inc. 169
Bristol Brass Corporation, The 45
Browning, Victor R., & Co., Inc. 202
Buffalo Bolt Co. 143
Bullard Co., The 33, 34
Bunting Brass & Bronze Co., The 131

Camcar Screw & Mfg. Corporation 53
Carpenter Steel Co., The 126
Cattie, Joseph P., & Brothers, Inc. 202
Central Screw Co., The 53, 167
Central Steel & Wire Co. 57
Chandler Products Corp. 78
Chicago Electric Co. 205
Cities Service Oil Co. 138
Clark Equipment Co., Industrial Truck Division 121
Cleveland Metal Abrasive Co., The 171
Cleveland Steel Tool Co., The 202
Colorado Fuel & Iron Corporation, The, Wickwire Spencer Steel Division 153
Columbia Steel & Shafting Co. 22
Consolidated Products Co., Inc. 205
Continental Screw Co. 53
Continental Steel Corporation 31
Cowles Tool Co. 196
Crucible Steel Casting Co. 200
Crucible Steel Company of America 9
Curtis Pneumatic Machinery Division of Curtis Manufacturing Co. 59
Cuyahoga Spring Co., The 151

Detroit Power Screwdriver Co. 196
Detroit Stamping Co. 201
Diamond Mfg. Co. 200
Duplex Mfg. & Foundry Co. 205

Eagle Lock Co., The 53
Eastern Machine Screw Corp., The 196, 204
Easton Car & Construction Co. 114
Elco Tool & Screw Corporation 53
Electric Boat Co., Electro Dynamic Division ... 29
Electric Controller & Mfg. Co., The 64
Electric Equipment Co. 204
Electro Dynamic Division of Electric Boat Co.. 29
Electro Metallurgical Co., A Division of Union Carbide & Carbon Corporation 54
Electro Refractories & Abrasives Corporation.. 124
Emhart Mfg. Co., The V & O Press Co. Division 26, 27
Erie Foundry Co. 36
Eureka Fire Brick Works 199
Ex-Cell-O Corporation 4, 5

Farrel-Birmingham Co., Inc. 150

Continued on following page

Like to OWN A Steel Mill?

Would you like to own a steel mill—today—and get all the tubes and pipe you need—and quick?

Sounds great doesn't it? But there's a catch,—in fact several—to the idea. One is that no modern steel mill could operate efficiently and turn out the 5,000 odd items that industry demands today. The requirements are too varied, the markets too vast. Volume production of a few items is the only way to make mill operations practical, to permit the delivery of steel at a reasonable price.

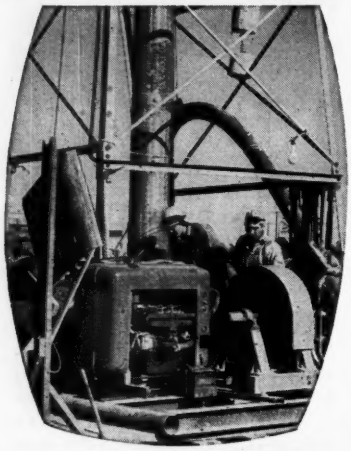
That's why we—and 1,500 other warehouse distributors—are part of the nation-wide distribution set-up. Because we buy for thousands of users, we can, and do, place volume orders—not with one, but with many mills. You benefit from this by being able to get the kind, type and size of tubular goods you want—and quickly—from warehouse stocks.

Even under today's stringencies, when tubular goods are in short supply, material is regularly moving into and out of our warehouses. We don't always have what you want today, but we may have it tomorrow. If you can anticipate your needs and place your orders early, it will help us to serve you better.

Our principal products are Stainless Steel Tubing and Pipe, Seamless Mechanical Tubing, Boiler and Pressure Tubes, Seamless Steel Pipe, Carbon and Stainless Steel Fittings. We fabricate pipe and tubing in our own shops.

STEEL TUBULAR PRODUCTS
A J MURRAY CO., INC.
ELIZABETH, N. J. McKEESPORT, PA.

"Making Hole" is just part of our job



To the well driller "Making Hole" means that everything is running smoothly and the hole is getting deeper and deeper. But to Layne, "Making Hole" is just part of building a fine well water supply.

Before a single rig is placed, Layne has used a lot of know-how planning, plotting and figuring out such things as; what size casing and what depth it is to be set, what kind and how much sand screen to use, what kind and size shafting to use and how much horse power the motors should have to produce the stipulated amount of water against a certain indicated pressure. Once all of these answers are on paper, they must be transmitted into an underground construction project;—a task that requires a lot of skill and ability.

But whether for a single unit or many, you may be sure that if installed by Layne, all will have the same peak efficiency, operate with precision smoothness and be of utmost dependability for now and the years to come.

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General Offices, Memphis 8, Tenn.

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VERTICAL TURBINE PUMPS
WATER TREATMENT

Advertising Index

Concluded from preceding page

Farval Corporation, The ..... Inside Back Cover
Ferro Corporation 198
Foote Bros. Gear & Machine Corporation 41
Foster, Frank B., Inc. 205
Foster, L. B., Co. 199, 205

General Electric Co. 23, 146, 147
Gerrard Steel Strapping Division, United States Steel Co. 130
Gordon, Claud S., Co. 140
Great Lakes Screw Corporation 53
Gregory Industries, Inc., Nelson Stud Welding Division 10

Halden Machine Co., The 166
Hanlon-Gregory Galvanizing Co. 160
Hansen Manufacturing Co., The 44
Harper, H. M., Co., The 53
Harris Foundry & Machine Co. 137
Hartford Special Machinery Co., The 127
Haynes Stellite Co., A Division of Union Carbide & Carbon Corporation 28
Heald Machine Co., The 2
Hendrick Manufacturing Co. 197
Hinde & Dauch 152
Holcroft & Co. 128
Holliday, W. J., & Co., Inc. 158
Hyatt Bearings Division, General Motors Corporation 82

Industrial Products Suppliers 200
Ingersoll-Rand 142
Inland Steel Co. 68
International Nickel Co., Inc., The 60
Iron & Steel Products, Inc. 205

Jones & Lamson Machine Co. 13
Jones & Laughlin Steel Corporation 149

Kaiser Aluminum & Chemical Sales, Inc., Chemical Division 115
Keokuk Electro-Metals Co. 111
Kling Bros. Engineering Works 67
Kold-Hold Mfg. Co. 136
Krause Stamping & Mfg. Co. 202

Laminated Shim Co., Inc., Stampings Division 173
Lamson & Sessions Co., The 53
Landis Machine Co. 8
Layne & Bowler, Inc. 208
Lead Alloy Products Co. 199
Leake Stamping Co., The 119
Levinson Steel Co., The 95
Lewis Foundry & Machine Division of Blaw-Knox Co. 11
Lewthwaite, T. H., Machine Co., Inc. 200
Link-Belt Co. 24
Lockheed Aircraft Corporation 203
Logan Co. 110
Logemann Brothers Co. 189
Luria Brothers & Co., Inc. 178

McKay Co., The 113
McLouth Steel Corporation 43

Mathews Conveyer Co. 199
Mattison Machine Works 20
Miller & Co. 111
Minnesota Mining & Mfg. Co. 35
Moline Tool Co. 202
Morgan Construction Co. 77
Morgan Engineering Co., The 107
Moto-Truc Co., The 168
Mueller Brass Co. 40
Murray, A. B., Co., Inc. 207

National Lock Co. 53
National Screw & Mfg. Co., The 53
National-Standard Co., Reynolds Wire Division 116
National Steel Corporation 37
Nelson Stud Welding Division of Gregory Industries, Inc. 10
New Departure, Division of General Motors Corporation 85
Niagara Blower Co. 12
Northern Engineering Works 129
Norton Co. 145
Norton Co., Behr-Manning Corporation Division 52
Nox-Rust Chemical Corporation 117

Oakite Products, Inc. 154
Ohio Knife Co., The 32
Ohio Locomotive Crane Co., The 200
Ohio Steel Foundry Co., The 90
O'Neil-Irwin Mfg. Co. 140
Osborn Manufacturing Co., The 3

Page Steel & Wire Division, American Chain & Cable 207
Parker-Kalon Corporation 42, 53
Pelron Corporation 6
Pheoll Manufacturing Co. 53
Pittsburgh Crushed Steel Co. 199
Pittsburgh Steel Co., Thomas Strip Division .. 155
Pollock, William B., Co., The 18
Poole Foundry & Machine Co. 200

Republic Steel Corporation 46
Reynolds Metals Co. 134, 135
Reynolds Wire Division, National-Standard Co. 116
Rockford Screw Products Co. 53
Roebling's, John A., Sons Co. 19
Ross Heater & Mfg. Co., Inc. 63
Rust-Oleum Corporation 49

St. Joseph Structural Steel Co. 205
Salem-Brosius, Inc. 51
Scovill Manufacturing Co. 48, 53
Screw Research Association 53
Seaver, Jay J., Engineers 172
Shakeproof, Inc. 53
Shenango-Penn Mold Co. 144
Silent Hoist & Crane Co. 130
Simonds Abrasive Co. 163
Simonds Saw & Steel Co. 21
Sisalkraft Co., The 201
Socony-Vacuum Oil Co., Inc. 58
Southern Screw Co. 53
Southington Hardware Mfg. Co., The 53
Steel Shot & Grit Co. 199
Sterling Bolt Co. 53
Stronghold Screw Products, Inc. 53
Superior Steel Corporation 141
Superior Tube Co. 93

Thew Shovel Co., The 184
Thomas Strip Division, Pittsburgh Steel Co. 155
Tide Water Associated Oil Co. 47
Timken Roller Bearing Co., The, Steel & Tube Division 86
Torrington Co., The 156
Tube Reducing Corporation 50

Udylite Corporation, The 14
Union Carbide & Carbon Corporation, Electro Metallurgical Co. 54
Union Carbide & Carbon Corporation, Haynes Stellite Co. 28
United States Rubber Co. 165
United States Steel Co., Gerrard Steel Strapping Division 130
United States Steel Corp., Subsidiaries 130
Upson-Walton Co., The 206

V & O Press Co., The, Division of Emhart Mfg. Co. 26, 27
Vanadium Corporation of America 190
Verson Allsteel Press Co. 30
Viking Steel Co. 89

Wales-Beech Corporation 53
Wallingford Steel Co., The 157
Wapakoneta Machine Co., The 170
Warner & Swasey 15
Wean Engineering Co., Inc., The ..... Back Cover
Weirton Steel Co. 37
Wellman Engineering Co., The 7
Wells Manufacturing Corporation 148
West Penn Machinery Co. 205
Wheeling Steel Corporation 202
Whitehead Stamping Co. 202
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 153
Wilkie Die Products Co. 205
Wilson, Lee, Engineering Co., Inc. 109
Worcester Stamped Metal Co. 112
Wrought Washer Mfg. Co. 114

York Engineering & Construction Co. 164
York-Gillespie Manufacturing Co. 164
Youngstown Foundry & Machine Co., The 56
Youngstown Sheet & Tube Co., The 25

Table of Contents Page 5

Classified Advertising Pages 204, 205